PUBLIC LIBRARY
AUG 22 1944
DETROIT

# ROADS AND STREETS

TECHNOLOGY DEPT.

AUGUST, 1944

OFFICIAL U. S. NAVY PHOTOGRAPH

## AFTER THE MARINES CAPTURED TARAWA

After the Marines had taken Tarawa and while mopping up operations were still proceeding, the Seabees moved in and with them went modern American construction equipment of all kinds.

This U. S. Navy photograph shows a fleet of La Plante-Choate Hydraulic Trail-builders equipped with Timken Tapered Roller Bearings working on an airfield.

Millions upon millions of Timken Bearings are actively engaged in the war — in combat, construction and auxiliary equipment — doing the job they have done and will do again in peacetime. To carry thrust, radial and combined loads — regardless of their origin — to fight friction and reduce wear and keep gears and shafts running in permanent and positive alignment. The Timken Roller Bearing Company, Canton 6, Ohio.

**TIMKEN**

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

# YOU GET *Speedy and Positive Controls* ON ADAMS MOTOR GRADERS

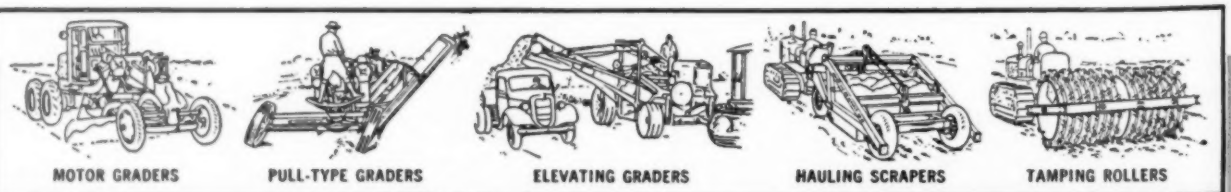
*One of a series of ads on Adams motor grader features*

EXPERIENCED grader operators—particularly those on construction work where frequent blade adjustments are necessary—want positive, dependable controls. When they operate their control levers they want to know what's going to happen and how fast . . . When you lower the blade on an Adams, it goes down at a constant, set speed and when you raise the blade it comes up at the same constant speed. The same positive action applies to the scarifier and leaning of the front wheels. And, with Adams mechanical controls you can operate two or more controls at the same time without affecting the set speed of any of them . . .

Positive acting controls are essential on fine work, such as the blading of black top on the contract job pictured above, but they are advantageous also on all types of grading and road maintenance. You want them and should have them whether you are contractor or highway official, so be sure of getting them by buying Adams . . . Not only are Adams controls positive and dependable in their action but they are speedy and easy to operate.

**J. D. ADAMS COMPANY · INDIANAPOLIS, IND.**

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



MOTOR GRADERS · PULL-TYPE GRADERS · ELEVATING GRADERS · HAULING SCRAPERS · TAMPING ROLLERS

# ADAMS

☆ ROAD-BUILDING AND ☆
EARTH-MOVING EQUIPMENT

# Bethlehem Steel for POST-WAR HIGHWAYS

It's going to be a huge post-war job, building the new highways needed by a growing America, carrying out hundreds of construction projects that had to lie fallow during the wartime years.

When the job begins, Bethlehem's complete line of highway products will again be at the service of road builders. Bethlehem road steels, backed by years of experience, have proved themselves—they're engineered all along the line for sturdy performance.

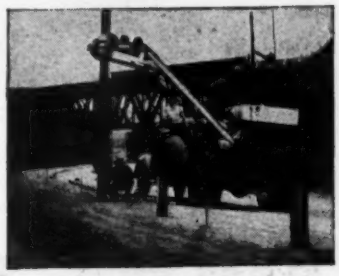
Plan to handle your post-war highway contracts by specifying this reliable source of supply for *all* road-steel products. Contractors can save time, bookkeeping and letter-writing by placing one order for all their needs for a given highway job with a conveniently-located Bethlehem warehouse. For full information about Bethlehem Road Steel Service, get in touch with the nearest district office, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

## REINFORCING STEEL

Bethlehem *Reinforcing Bars,* plain and deformed, are made of new billet steel in standard sizes and grades, and can be bent to shape and cut to size in most Bethlehem warehouses. *Bar Mats,* made of deformed bars clipped together, are easy and convenient to install, and lie flat. *Welded Wire Fabric* is fabricated from tough, cold-drawn wire to meet all standard highway specifications.

## HIGHWAY GUARD

Bethlehem's beam-type guard rail, called the *Safety-Beam,* is made in standard 12 ft., 6 in. lengths, or if preferred, can be supplied in lengths up to 50 ft. *Cable Guard Rail* is durable three-strand steel cable, with a double-galvanized coating. *Highway-Guard Bracket,* made of high-tensile spring steel, is attached with one bolt to steel or wood posts, and supports three or four cables.



## STEEL POSTS

Bethlehem *Steel Highway Guard Posts* are readily driven and have superior resistance to impact and side thrust. Bethlehem Steel *Highway Sign Posts* are wide-flange channel sections, punched with holes and pointed for easy driving.

## STEEL PILING

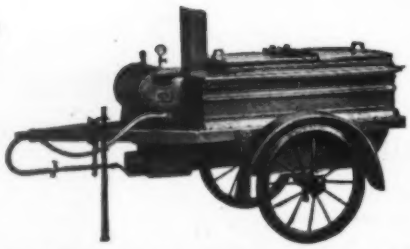
Bethlehem *Steel Sheet Piling* for temporary or permanent retaining structures. *Steel H-Bearing Piles* for bridges, over- and under-pass, and other load-bearing structures.

BETHLEHEM STEEL

### OTHER BETHLEHEM PRODUCTS FOR HIGHWAYS

ROAD JOINTS · DOWELS · DOWEL BAR SUPPORTS
ROAD STRIP · WIRE ROPE AND STRAND · BAR TIES
GUARD RAILS · ANCHOR RODS · RIGHT-OF-WAY FENCE AND POSTS
PIPE · HOLLOW DRILL STEEL · DIGGING BARS
STRUCTURAL STEEL · STEEL CRIBBING MOLD BOARDS
REINFORCING FOR CONCRETE · BRIDGE FLOOR REINFORCING
CORRUGATED SHEETS · CONCRETE SLAB SPACERS
TURNBUCKLES · TIE RODS, SPIKES, BOLTS AND NUTS
TIMBER BRIDGE HARDWARE

*For speedy heating of tar and asphalt—*



**Use this CONNERY oil-burning Patrol Patching Heater on the *small* job and this CONNERY oil-burning kettle for *large-quan-*-roduction.**

**atalog ar full and as-ing ket-ying at-s, pouring**

**CONNERY CON ION Co.**
3900 North Second St. Philadelphia, Pa.

A WESTERN state highway department reports:

"We save thousands of dollars with the Baker Disc Attachments on our motor graders. By disking and reworking the wearing surface of asphaltic roads and oiled shoulders along our two-lane highways, we eliminate chuck holes, thus protecting the road base indefinitely."

A number of state and county highway departments have found Baker Disc Attachments time and manpower savers and cost-cutters. Doubles the utility of any grader. Swings up out of the way when not in use. Send for Bulletin 831.

**THE BAKER MFG. CO.**
**506 Stanford Ave. • Springfield, Ill.**

*"If it concerns Victory, it concerns us!"*

BULLDOZERS · SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT

# ROADS AND STREETS

Vol. 87, No. 8 August, 1944

ECA

*A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; and to the construction and maintenance of airports.*

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD ROADS MAGAZINE AND ENGINEERING & CONTRACTING

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; HAROLD J. McKEEVER, Editor; CHARLES T. MURRAY, Managing Editor; JOHN C. BLACK, Field Editor; LT. COL. V. J. BROWN, Publishing Director (Absent on Military Duty); H. J. CONWAY, Advertising Editor; L. R. VICKERS, Promotional Director.

## CONTENTS

Detroit Industrial Expressway ..... 59

Editorial ..... 67

6500 Ft. Daily with Special Widening Equipment .... 68
By W. H. Moore, Div. Engineer, Ohio Dept. of Highways, Ravenna

How It Was Done—Labor-Saving Job Methods ..... 70

Asphalt Maintenance in Washington, D. C. ..... 75
By H. C. Whitehurst, Director of Highways District of Columbia, Washington, D. C.

Asphalt Center Stripes Stay Put ..... 80

Elevated Highways Over Railway Lines ..... 85
By H. Jay Wallace, Asst. City Planning Engineer City Planning Commission, Atlanta, Ga.

Construction Equipment Maintenance Section:
Wartime Kinks That Keep Jobs Humming ..... 89

How Mechanical Defects Can Rob You of Rubber. 92

Army Engineers: Spare Parts Distributors Around the World ..... 93

With Road Builders in Uniform ..... 97

Syracuse Saves Money on Snow Removal ..... 98

New Equipment and Materials ..... 100

With the Manufacturers ..... 103

Coronach ..... 108

New Trade Literature ..... 109

Published Monthly by Gillette Publishing Co., 330 South Wells St., Chicago, Ill.; New York office, 155 E. 44th St.; Cleveland office, Leader Bldg.; Los Angeles office, 816 W. 8th St. Subscription price $3.00 per year in the United States, $3.60 per year in Canada, $4.00 per year for foreign mailing.

# LORAINS ARE IN THE THICK OF IT everywhere!

In London, Lorain Moto-Cranes clear away wreckage after the London "Blitz".

In the South Pacific, a Lorain Crane salvages a wrecked Jap destroyer.

In Italy, a Lorain scoops up debris from a bombed building to clear the way for the advance.

In the Aleutians, when it isn't snowing or freezing, Lorains have mud conditions such as this to contend with.

THE Turnpike, Radio City, the Alcan, Big Inch, the Pan American Highway and scores of other big-time jobs ... Lorains are veterans of them all. But never have Lorains tackled jobs as big, as important, or as tough as those you'll find them working on, at the fighting fronts the world over.

Right now, these jobs in Italy, the Aleutians, in Britain and the South Pacific are full-time operations for Lorains, but there are other big jobs coming up; the postwar program of equally important, necessary, at-home jobs.

Lorains will again be available for whatever material handling job that comes your way, but with this essential difference; because of their wartime experiences, improvements and developments, Lorains will be equipped even better, to serve you profitably.

You'll be wise in starting to find out about these better Lorains by getting in touch with the Lorain Distributor in your territory right now. He has the facts, the experience and the facilities to serve you well and wisely in planning your postwar equipment setup.

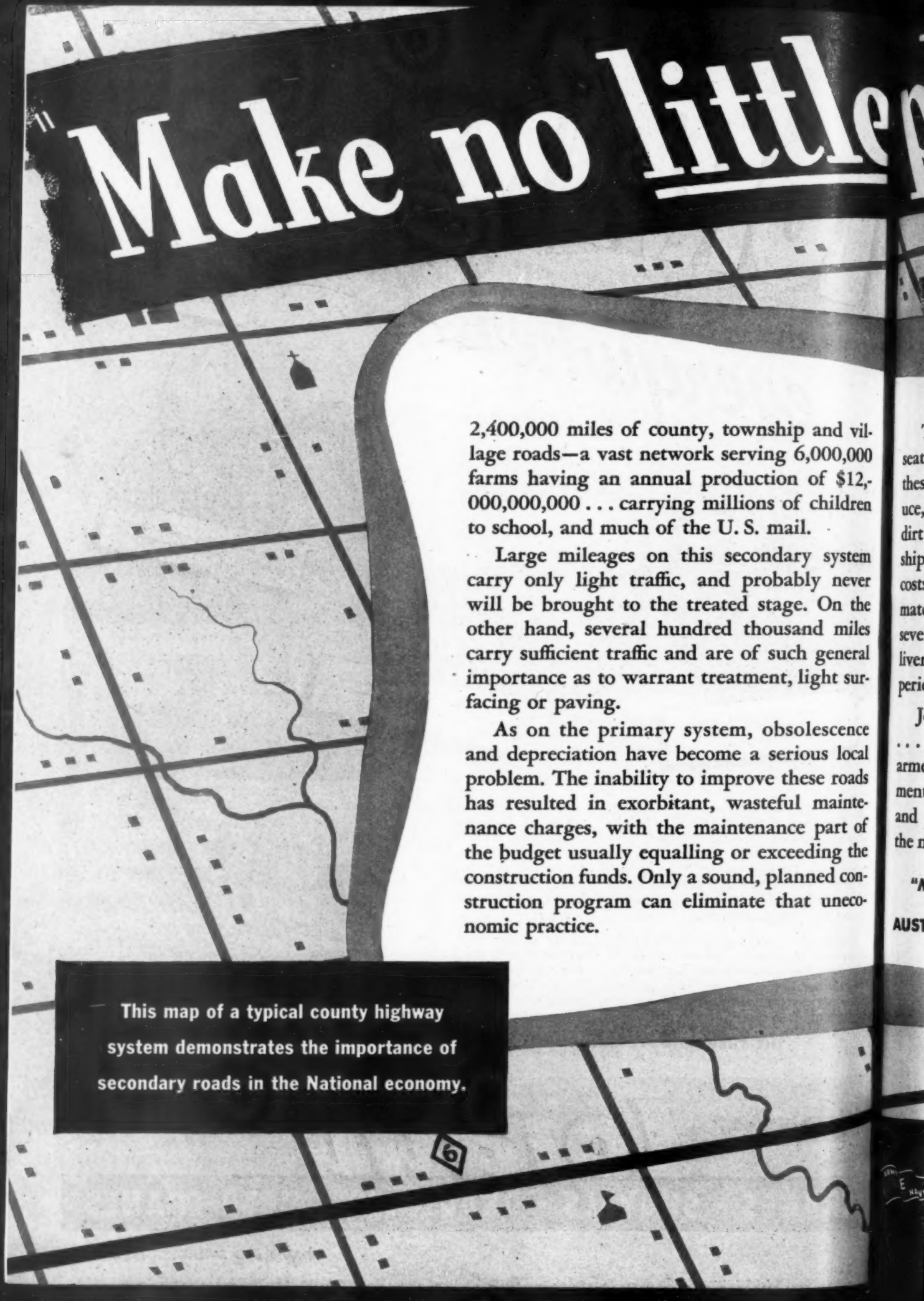
**THE THEW SHOVEL COMPANY • Lorain, Ohio**

Reg. Trade Mark

**thew-Lorain**

**CRANES • SHOVELS • DRAGLINES • MOTO-CRANES**

# "Make no little

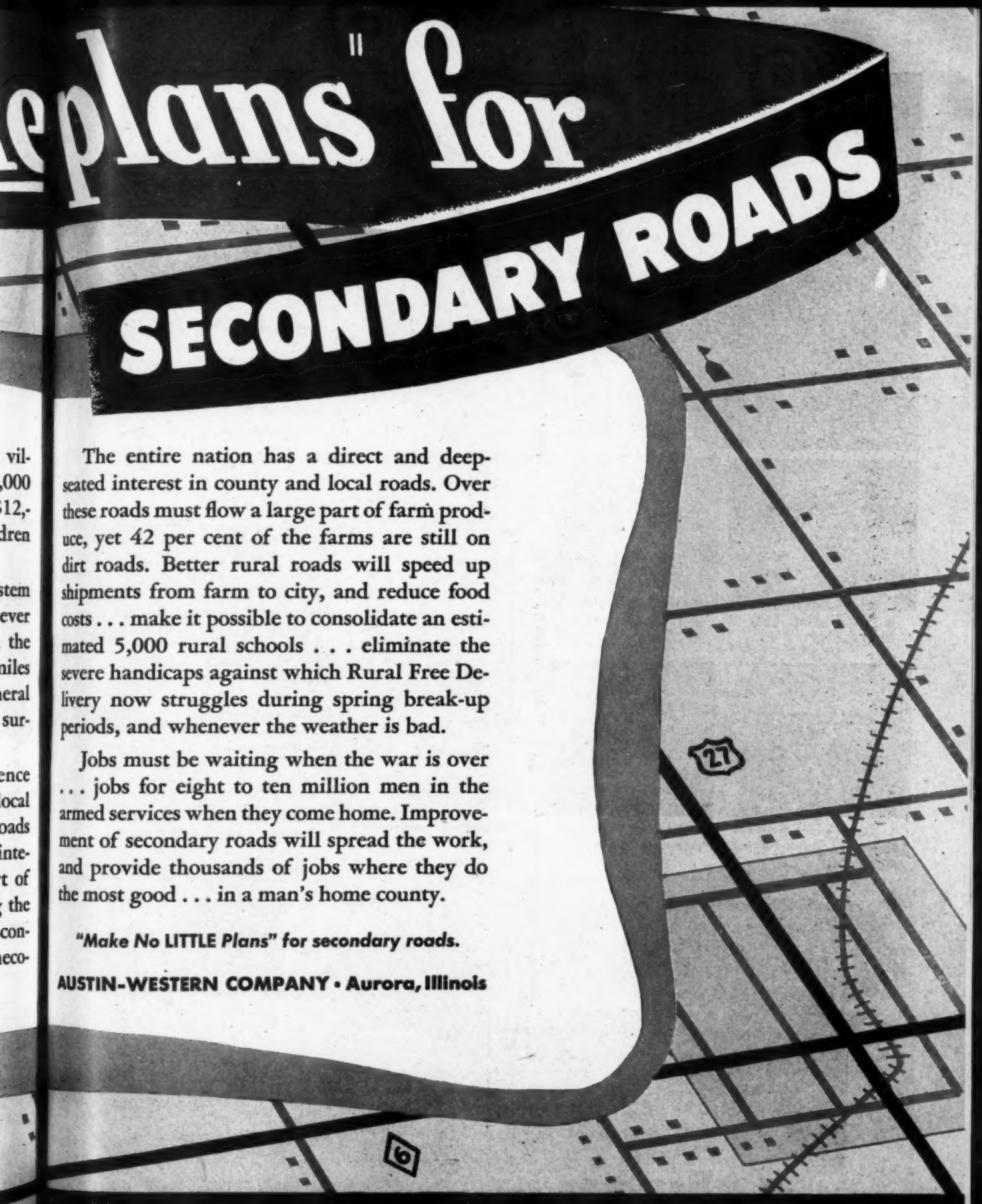


2,400,000 miles of county, township and village roads—a vast network serving 6,000,000 farms having an annual production of $12,000,000,000 . . . carrying millions of children to school, and much of the U. S. mail.

Large mileages on this secondary system carry only light traffic, and probably never will be brought to the treated stage. On the other hand, several hundred thousand miles carry sufficient traffic and are of such general importance as to warrant treatment, light surfacing or paving.

As on the primary system, obsolescence and depreciation have become a serious local problem. The inability to improve these roads has resulted in exorbitant, wasteful maintenance charges, with the maintenance part of the budget usually equalling or exceeding the construction funds. Only a sound, planned construction program can eliminate that uneconomic practice.

This map of a typical county highway system demonstrates the importance of secondary roads in the National economy.




The entire nation has a direct and deep-seated interest in county and local roads. Over these roads must flow a large part of farm produce, yet 42 per cent of the farms are still on dirt roads. Better rural roads will speed up shipments from farm to city, and reduce food costs . . . make it possible to consolidate an estimated 5,000 rural schools . . . eliminate the severe handicaps against which Rural Free Delivery now struggles during spring break-up periods, and whenever the weather is bad.

Jobs must be waiting when the war is over . . . jobs for eight to ten million men in the armed services when they come home. Improvement of secondary roads will spread the work, and provide thousands of jobs where they do the most good . . . in a man's home county.

***"Make No* LITTLE *Plans" for secondary roads.***

**AUSTIN-WESTERN COMPANY • Aurora, Illinois**

BUILDERS OF ROAD MACHINERY

**Austin Western**

SINCE 1859

BUY MORE WAR BONDS

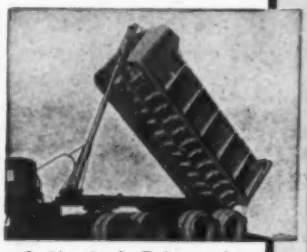
1. Direct-Lift Hoist. Body has Trussed Understructure. Exclusive feature.

2. Cam and Roller Hoist for long wheelbase chassis. High ground clearance for piling.

3. Typical installation for Six Wheelers.

4. Telescopic Hoist. Heavy-Duty Body.

5. Dual Telescopic Hoist and Rock Body. Down Folding Gate.



6. Vertical Telescopic Hoist for long Bodies.

7. Tanks for all types of liquids.

8. Street Flushers and Sprinklers.

GW

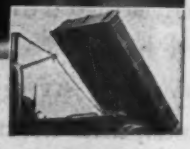
# GAR WOOD TRUCK EQUIPMENT

## HOISTS • BODIES • TANKS WINCHES and CRANES For TRUCKS and TRAILERS

GW engineers specialize in designing the type of equipment best suited for the work to be performed. Gar Wood Industries, Inc., manufactures hydraulic and mechanical hoists, dump bodies, winches, cranes and tanks (including flushers and sprinklers) for a wide variety of uses on trucks and trailers.

9. Hydraulic Repair Tower.

10. Cranes — all types and sizes for handling pipe, machinery, etc.

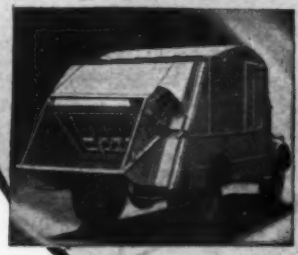


11. Crane with Winch and Dump Body.

**Refer to Picture Number when ordering literature**

12. Tree-Moving Crane.

13. Picks up, transports and resets treeballs.



14. Load-Packer — compresses garbage and rubbish. Greater loads—fewer trucks and men required.

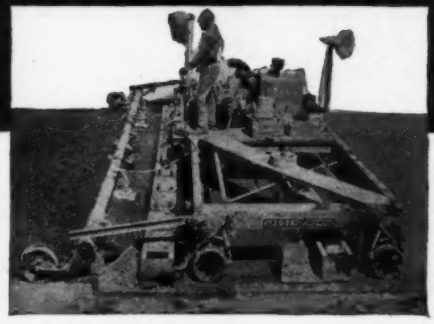
**GAR WOOD INDUSTRIES, Inc.**
DETROIT 11, MICHIGAN

**BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES**

GAR WOOD GW INDUSTRIES, INC. TRADE MARK

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

# LOOK AHEAD WHEN YOU PLAN PAVING—Today's Jaeger Methods Meet Tomorrow's Specifications



## 1 CONCRETE RE-MIXED ON THE SUBGRADE by compacting spreader screw

Comparative tests by highway engineers of various States have proved conclusively that the Jaeger method of screw-spreading concrete produces a more uniform, denser and, therefore, longer wearing slab.

By its thoro and positive re-mixing and inter-mixing of piles dumped on the subgrade, both the segregation of coarse aggregates in the batch and the variations between different paver batches are eliminated: badly placed batches are redistributed to leave a uniform spread of material ahead of the Finishing Machine, with material placed so solidly against the road base and side forms as to eliminate the honeycomb problem and the entire mass compacted to weight and density approaching that of vibrated concrete.

As one prominent engineer states: *"It has been demonstrated that the quality of concrete can be improved and at the same time cost of production to the contractor can be reduced."*

It is logical to expect that re-mixing on the subgrade will be specified by Highway Depts. to insure higher strength, longer life pavements.

## 2 VIBRATION ON THE FINISHER, not on the concrete spreader.

Although Jaeger can furnish a vibratory attachment for use on Spreaders, the recommended Jaeger method of *vibration on the Finisher* has proved superior for any true vibratory mix. On an efficiently run job, only the Finisher has time to go back for more than one vibratory pass, as often needed. Also, it is the machine which always finishes to form level, thus insuring an over-all vibrated surface.

To meet future specifications we recommend the Jaeger Vibratory Finisher with "bullnose" screed giving DEEP INTERNAL VIBRATION or, where conditions suit, use of a vibratory tube *on the Finisher.*

## 3 FAST MECHANIZED HANDLING for quick-drying air-entraining cements.

The Spreader-Finisher "team," originated by Jaeger, which made it possible to handle stiff, vibratory concrete at the dual-drum paver pace, also equips road builders to handle quick-drying air-entraining cements. Under hot, windy or dry air conditions the Jaeger "team" has the spreading and finishing capacity needed to keep close behind big pavers and complete the job before drying hinders a satisfactory finish. Also Jaeger, alone, has the independent, fast screed speeds often needed to prevent tearing of the sticky surface.

For further information, ask your Jaeger distributor or write us for contractors' and engineers' reports.

**The Jaeger Machine Co., 223 Dublin Ave., Columbus 16, Ohio**

**JAEGER *Engineered* EQUIPMENT**

"Sure Prime" Pumps, "SpeedLine" Mixers, "Air Plus" Compressors, "Fleet-Foot" Loaders, Jaeger Hoists, Spreaders and Finishers

# Three Richkraft Scoops

## The First Richkraft Scoop!

Richkraft is proud to present Skufpruf Heavy Duty Reinforced Paper (It's Plasticized)! — a new plastic treated paper to the Construction Industry. From pulp log to finished sheet, it remains in one plant under our technicians' constant control and supervision. The result is a finished sheet of amazing toughness—and a "high wet strength" unmatched in its field.

Our new plasticizing treatment starts with the raw pulp in the "beaters" and is carefully extended through the entire manufacturing process. Plasticizing is not just a "puddle treatment," not just a surface treatment. Plasticizing is just as much an integral part of the paper as is the wood fibre itself.

## The Second Richkraft Scoop!!

For the first time in the history of construction, Richkraft now offers reinforced paper in 10 ft. widths, instead of the usual 7 ft. maximum. This eliminates one lap from manufacturing costs of blankets over 14 ft. wide. On a blanket 26 ft. 6 in. wide, it cuts the lap labor cost one-third — a big economy! With one less lap, it makes an easier handling, smoother rolling unit.

## The Third Richkraft Scoop!!!

A new method of handling blankets on road jobs which revolutionizes the old-fashioned methods of field handling! Instead of using a blanket wide enough to reach from grade to grade, Richkraft now introduces "Stringer Sheets."

These sheets are 18 in. wide and are separate from the main body of the blanket. On a 22 ft. road, for example, we will furnish a blanket 22 ft. 4 in. x 60 ft. with two stringer sheets 18 in. x 60 ft. These stringers will be rolled up at the outer edges of the blanket at time of manufacture. The big blanket will be rolled out on the slab in the usual manner and secured with earth. But there will be no overhanging paper to flop around during the first day while the forms are still in place—or to get in the way if the form stripping covers the next morning.

When the forms are stripped, the stringer is simply pulled out from under the big blanket, folded down along the slab side and held with earth in the usual manner. *And here's the big advantage in this procedure:* Should a truck or tractor bang against the side of the slab, it damages *only the stringer sheet containing 90 sq. ft. of paper,* costing approximately $1.00. The main blanket, representing an investment of $15.00 to $24.00 is untouched! Then too, the edges of a blanket under the old-fashioned method were always the first part of the unit to rot and deteriorate. Often a blanket had to be discarded because the edges were frayed and worn, even though the rest of the cover was in excellent condition.

This won't happen "The Richkraft Way!" It's smooth — It's simple — It doubles the life of road covering blankets and offers a big savings to the contractor. All in all—it is just conclusive proof that Richkraft truly is—

"THE CONTRACTOR'S PAPER
*Designed by Construction Men.*"

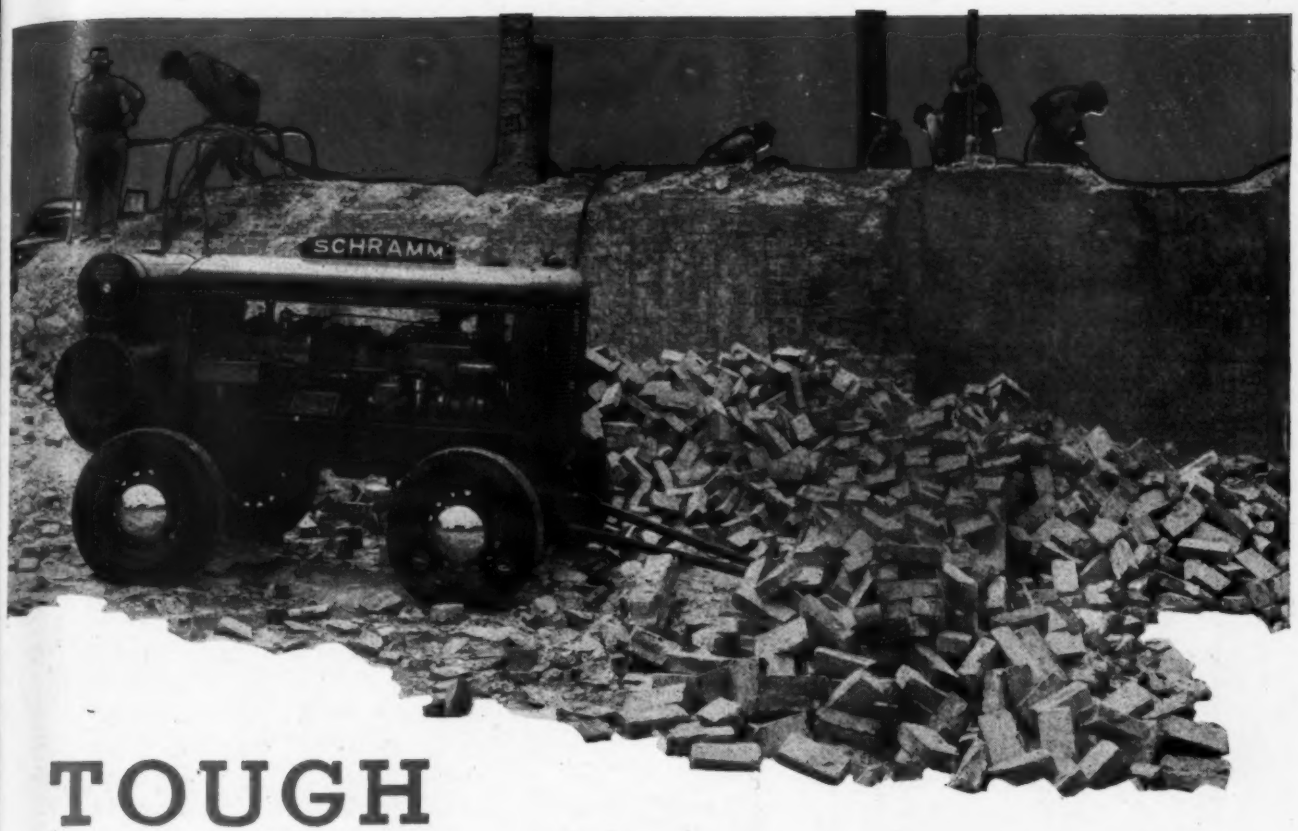
Write us for samples or ask your dealer for the full details on this amazing new sheet.

**THE RICHKRAFT COMPANY** • **BUILDERS BLDG., CHICAGO 1, ILL.**

**7 W. STATE STREET, WESTPORT, CONN.**

Subgrade Paper . . Curing Compounds and Spray Machines
TARPAULINS . . "PRISMO" Reflecting Paint . . "SEALZ" Joint Sealer

Richkraft BUILDING PRODUCTS




# TOUGH

## Construction jobs SIMPLIFIED!

Merely by easily moving a Schramm Air Compressor onto the job—and touching a starter button—you get all the compressed air you want—and your construction job becomes a cinch!

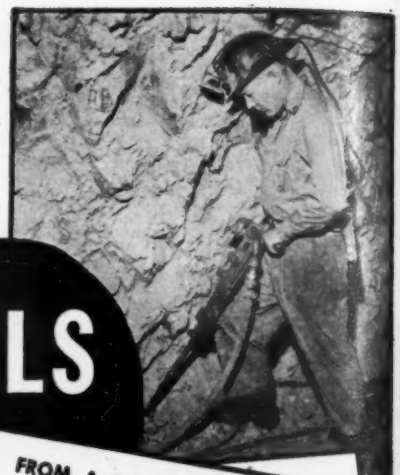
On the one hand, Schramm Compressors are rugged, tough "babies"... on the other, lightweight and compact so they can be towed to any job. This means: no job is too tough—and you get air anywhere you want it!

Note these Schramm features: 1. Completely watercooled to provide ideal performance both summer and winter. 2. Electric push button starter. 3. Mechanical intake valve. 4. More cylinders and lighter parts. 5. Forced feed lubrication.

Simplify your construction job by using Schramm Compressors. Write today for list.

**SCHRAMM INC.** THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

# *We Quote* - CONTRACTORS EVERYWHERE...



# *Thor* ROCK DRILLS

## "OUT-DRILL EVERYTHING ON THE JOB"

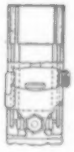
### CONTRACTORS ARE *SOLD* ON THESE THOR PERFORMANCE AND MAINTENANCE FEATURES

**● LOW AIR CONSUMPTION**

Thor Positive Short-Travel Tubular Valve uses effectively every ounce of air that enters the machine . . . measures air to a tolerance of .00025 of an inch!

**● STEADY, FAST DRILLING**

Extra-powerful rotation through extra sturdy rifle bar assembly and positive, non-slip ratchet action prevents stalling, even in heavy, sticky formations . . . full air power behind the piston gives the steel maximum forward and rotating power.

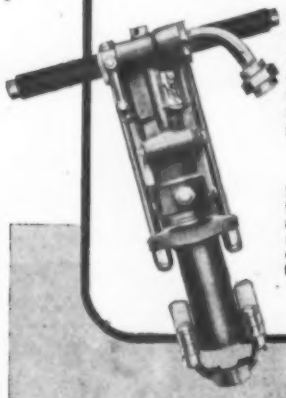


**● AUTOMATIC LUBRICATION**

On each reciprocation of the Thor piston hammer, oil is forced under pressure through a felt filter pad to keep every part of the machine constantly lubricated.

**● OPERATING EASE**

The Thor four-position throttle gives the operator complete control of drilling speeds for all operating conditions. Exclusive Thor spring retainer design provides quick, easy removal of the steel—provides longer life with fully enclosed springs that cannot clog or be over-tightened.



**● POWERFUL HOLE-BLOWING**

Thor air economy in turning every foot of air into power combines with powerful rotation to provide steady, maximum hole-cleaning ability.

**Send today for complete information about Thor's wide range of light and heavy duty sinker, drifter and stoper rock drills and associated contractors' tools in Catalog 42-A.**

**FROM A MAMMOTH PENNSYLVANIA TUNNEL JOB***

"Thor Rock Drill was put through rugged stripping tests and out-drilled everything on the job, showing exceptionally powerful hole-blowing capacity by holding to steady drilling despite hitting three inches of clay every three or four feet."

**FROM AN ARIZONA DEVELOPMENT***

"Thor Rock Drill used in five different veins of varied texture and hardness showed such excellent results that runners took it apart to admire fine construction."

**FROM A COLORADO CONTRACTOR***

"Thor Rock Drill drilled as deep as 25 feet in clay streaked conglomerate rock with amazing hole-cleaning power...out-drilled every other tool on every operation."

Straight from the work come these reports of Thor Rock Drills *out-drilling everything on the job* in all types of underground and surface hard-rock operations.

*On-the-job* tests like these are making Thor Rock Drills the popular choice of contractors everywhere who *know* Thor performance . . . who *know* the low maintenance, smoother, faster handling made possible by Thor design and construction.

*Name furnished on request.

*Thor* Portable Pneumatic and Electric Tools

**INDEPENDENT PNEUMATIC TOOL COMPANY**

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

# Back of every Velvetouch-Installation . . .

Behind each Velvetouch clutch facing and brake lining are years of leadership in developing powdered metal friction materials . . . plus the facilities of a well equipped laboratory devoted exclusively to the study of pairs of *rubbing surfaces.* Modern science and engineering skill can produce no finer friction materials than Velvetouch for brake and clutch replacements in tractors, power shovels and other earth-moving equipment.

**THE S. K. WELLMAN COMPANY**
1374 EAST 51st STREET • CLEVELAND 3, OHIO

## Interesting facts about *Friction*

The coefficient of friction (f) of a book sliding across a table top is easily determined by dividing the weight of the book (W) by the amount of force required to slide the book (F).

Because many factors affect the coefficient of friction, i.e. speed, pressure, temperature, etc., it is impossible for any material to have a uniform coefficient of friction under all operating conditions.

The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give the best possible coefficients of friction for each installation.

**For Brake and Clutch . . . Use Velvetouch**

Velvetouch is ***all metal*** — a combination of powdered metals, compressed, sintered and welded to a solid steel backing.

You wouldn't

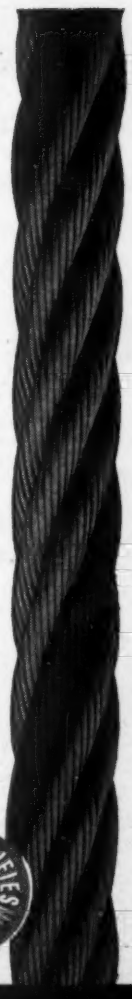
# put splints on a TOE DANCER

## LAY·SET *Preformed* IS FREE

The preforming process frees **LAY-SET** Wire Rope of muscle-bound stresses. Being preformed, Hazard **LAY-SET** is not hampered by needless strains. Rather, every wire and strand is free to do its full share of work from the very first hour it is put on your machine.

Hazard **LAY-SET** Preformed is a "pre-broken-in" rope; it resists snarling and kinking; it handles easier, faster, safer and cheaper. It possesses high resistance to bending fatigue and so lasts longer —much longer than non-preformed wire rope. Regardless of where or how you use wire rope, whether for running or standing service, specify Hazard **LAY-SET** Preformed—the rope that gives you greater dollar value.

Hazard **LAY-SET** Preformed Wire Rope is "in the service" on countless jobs for the Armed Forces where it is proving its many advantages. Specify it for *your* use.



**HAZARD WIRE ROPE DIVISION** • Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

**AMERICAN CHAIN & CABLE COMPANY, INC.** • BRIDGEPORT • CONN.

**HAZARD LAY·SET *Preformed* WIRE ROPE**

# LITTLEFORD
## Model No. 155

## THE PORTABLE
# TRAIL-O-ROLLER

**CHANGES FROM TRAILING TO ROLLING POSITION IN 2 MINUTES TIME**

When a Roller is needed on the job, no delays are necessary when a Trail-O-Roller is used. It can be taken right with the maintenance or construction crew hooked right behind a truck. The Trail-O-Roller is small, compact, yet gives as much compaction per inch of roller width as a 5-ton tandem roller. When it's ready to roll a road, highway, airport runway, parking area, etc., it can be changed from trailing to rolling position, or visa versa, by a hydraulic lift in 2 minutes' time.

For better roads, use the best equipment. Make plans to own a Littleford Trail-O-Roller.

BLACK TOP ROAD MAINTENANCE EQUIPMENT — LB — SINCE - 1900

**LITTLEFORD**

**Littleford Bros., Inc.**
454 E. Pearl St., Cincinnati 2, Ohio

MOTOR GRADERS • ROAD ROLLERS

# THE GALION IRON WORKS & MFG. CO.

**MAIN OFFICE AND WORKS: GALION, OHIO**

Davidson Limited Highway is helping Detroit avert traffic chaos. Many cities need similar direct routes through built-up areas.

# Urban Expressways Call for CONCRETE

Many cities are now making comprehensive plans for redesigning their street systems to include expressways which will reduce accidents and handle traffic in congested areas at minimum cost.

Urban expressways and heavily traveled streets to carry, economically, the increased volume of postwar traffic, must be built of a long-lived material. Concrete has the strength and stamina to carry the heaviest traffic safely at low annual cost.

Concrete construction conserves motor tax money. Not only is the first cost of concrete pavement less than for other pavement of equal load-carrying capacity, but the annual surface maintenance cost is less.

Our engineers will gladly help you work out the most economical concrete pavement designs for your postwar program.

**PORTLAND CEMENT ASSOCIATION**

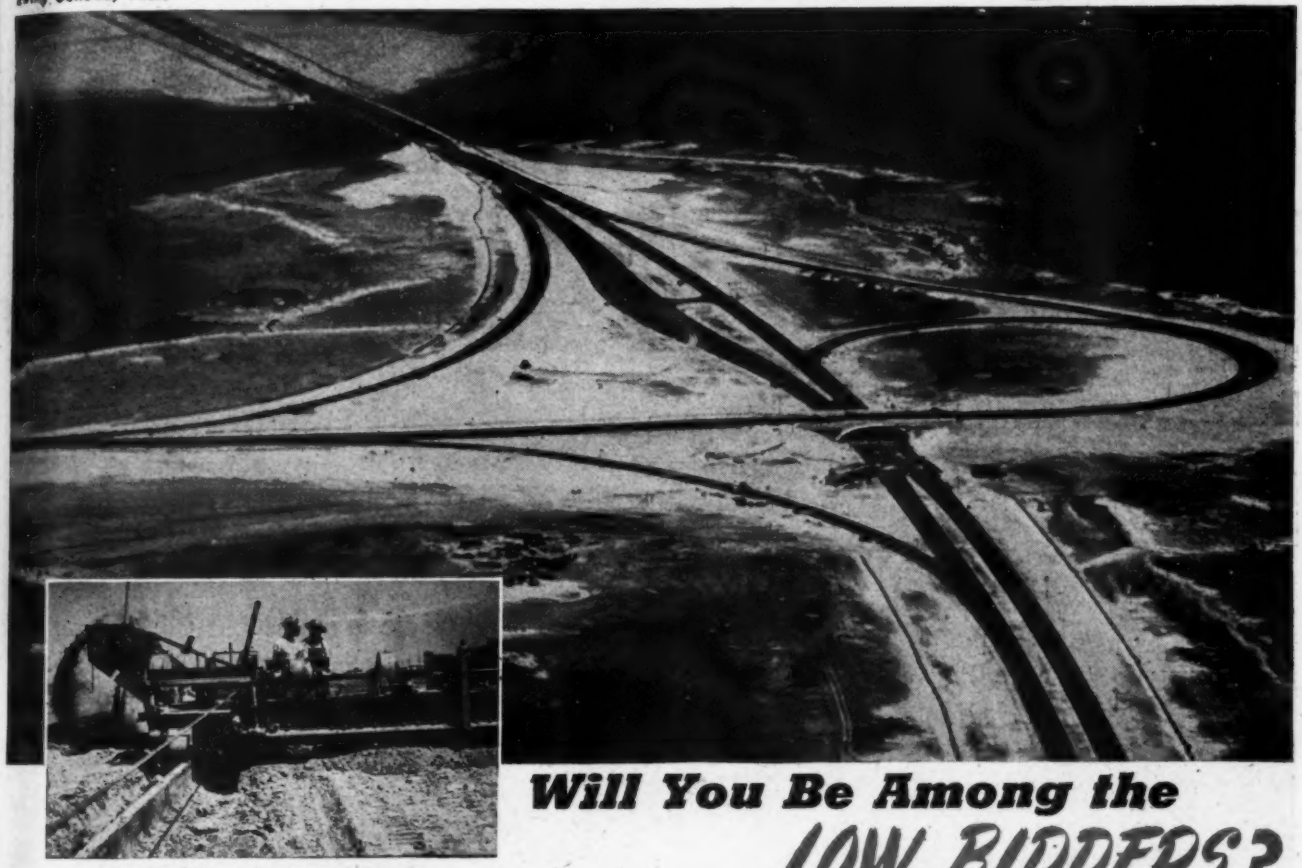
Dept. 8-28, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

★ *BUY MORE WAR BONDS* ★

# when SUPERHIGHWAYS are built again...

Ewing Galloway Photo





## LOOK AHEAD

Records show that 75% of unemployment during the depression came from the durable goods industries. Construction is an important part of this. The $3,000,000,000 postwar road program recommended by the American Road Builders Association will meet the nation's highway transportation needs, put war-neglected roads back in shape and provide sufficient employment to help maintain economic balance. Are you behind this plan?

## Will You Be Among the LOW BIDDERS?

A TREMENDOUS backlog of critically needed road construction is building up for the postwar period. Are you getting ready now to meet it? Today is a good time to investigate the advantages of Buckeye R-B Power Finegraders for faster work, lower costs, better grades, reduction of loss of yield. These machines eliminate delays on the grade which hold up the paving crew, do away with fussing with high and low spots, assure you of a gradeline that meets specifications. No other existing equipment can prepare subgrade as quickly, accurately or cheaply. Send for a descriptive bulletin today and be ready to be among the successful low bidders tomorrow.

**BUCKEYE TRACTION DITCHER CO.**
*Findlay, Ohio*

**Buckeye**

Tractor Equipment
Road Wideners
Power Finegraders
Trenchers
Convertible Shovels
Spreaders

RB POWER FINEGRADER

# Correct Lubrication

## MEANS

# BETTER MAINTENANCE

• Very often, *correct* lubrication is the remedy for difficult maintenance due to excessive wear.

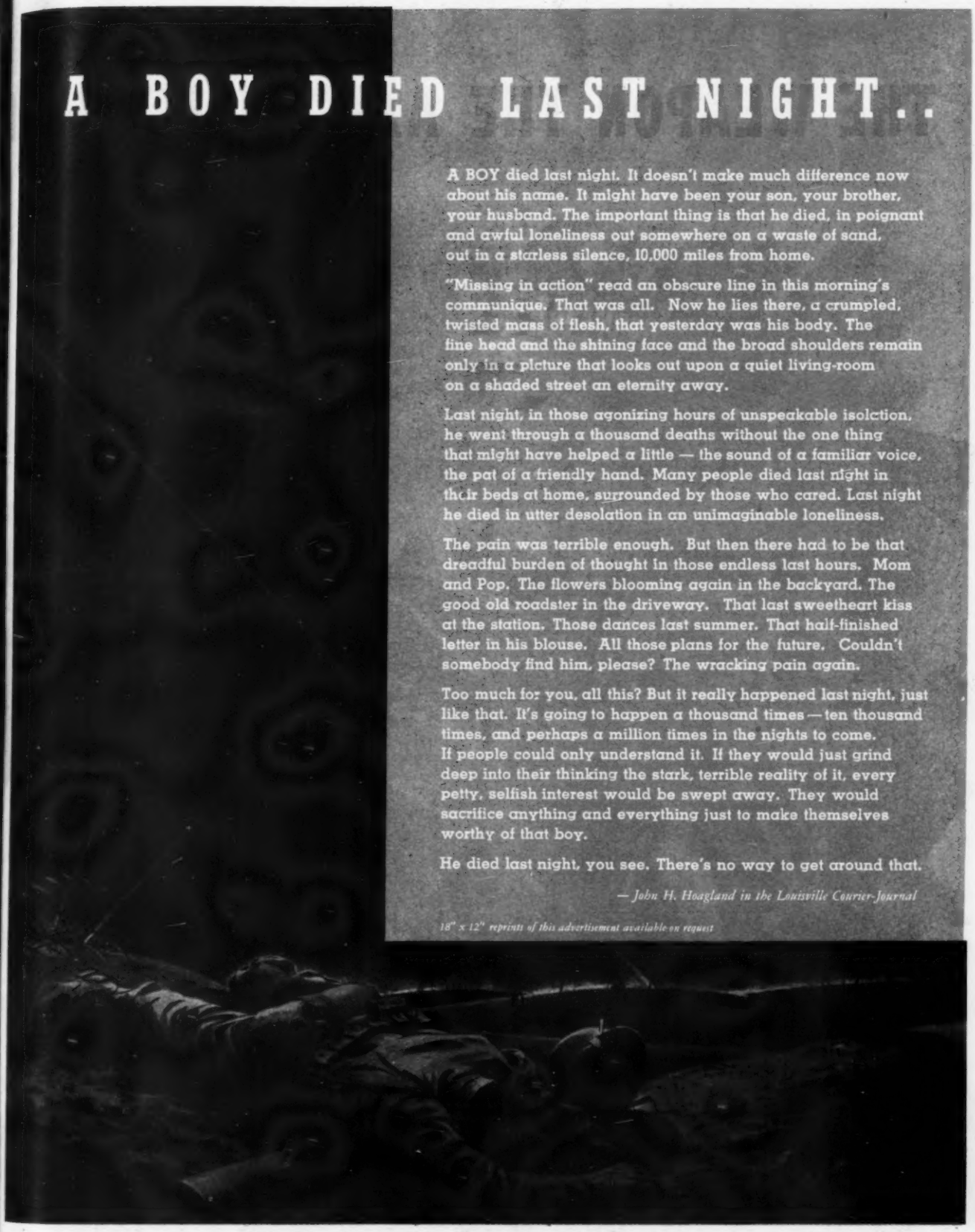
For *correct* lubrication of *CONSTRUCTION EQUIPMENT* Sinclair provides highly specialized Motor Oils, Gear Oils, and Greases... lubricants with wear preventive qualities that help keep down maintenance and replacement costs. Sinclair Ten-ol 200 is especially efficient for Diesel engines and Diesel-powered shovels, buckets, and bulldozers.

• • •

*(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)*

## SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.



# A BOY DIED LAST NIGHT..

A BOY died last night. It doesn't make much difference now about his name. It might have been your son, your brother, your husband. The important thing is that he died, in poignant and awful loneliness out somewhere on a waste of sand, out in a starless silence, 10,000 miles from home.

"Missing in action" read an obscure line in this morning's communique. That was all. Now he lies there, a crumpled, twisted mass of flesh, that yesterday was his body. The fine head and the shining face and the broad shoulders remain only in a picture that looks out upon a quiet living-room on a shaded street an eternity away.

Last night, in those agonizing hours of unspeakable isolction, he went through a thousand deaths without the one thing that might have helped a little — the sound of a familiar voice, the pat of a friendly hand. Many people died last night in their beds at home, surrounded by those who cared. Last night he died in utter desolation in an unimaginable loneliness.

The pain was terrible enough. But then there had to be that dreadful burden of thought in those endless last hours. Mom and Pop. The flowers blooming again in the backyard. The good old roadster in the driveway. That last sweetheart kiss at the station. Those dances last summer. That half-finished letter in his blouse. All those plans for the future. Couldn't somebody find him, please? The wracking pain again.

Too much for you, all this? But it really happened last night, just like that. It's going to happen a thousand times — ten thousand times, and perhaps a million times in the nights to come. If people could only understand it. If they would just grind deep into their thinking the stark, terrible reality of it, every petty, selfish interest would be swept away. They would sacrifice anything and everything just to make themselves worthy of that boy.

He died last night, you see. There's no way to get around that.

*— John H. Hoagland in the Louisville Courier-Journal*

*18" x 12" reprints of this advertisement available on request*

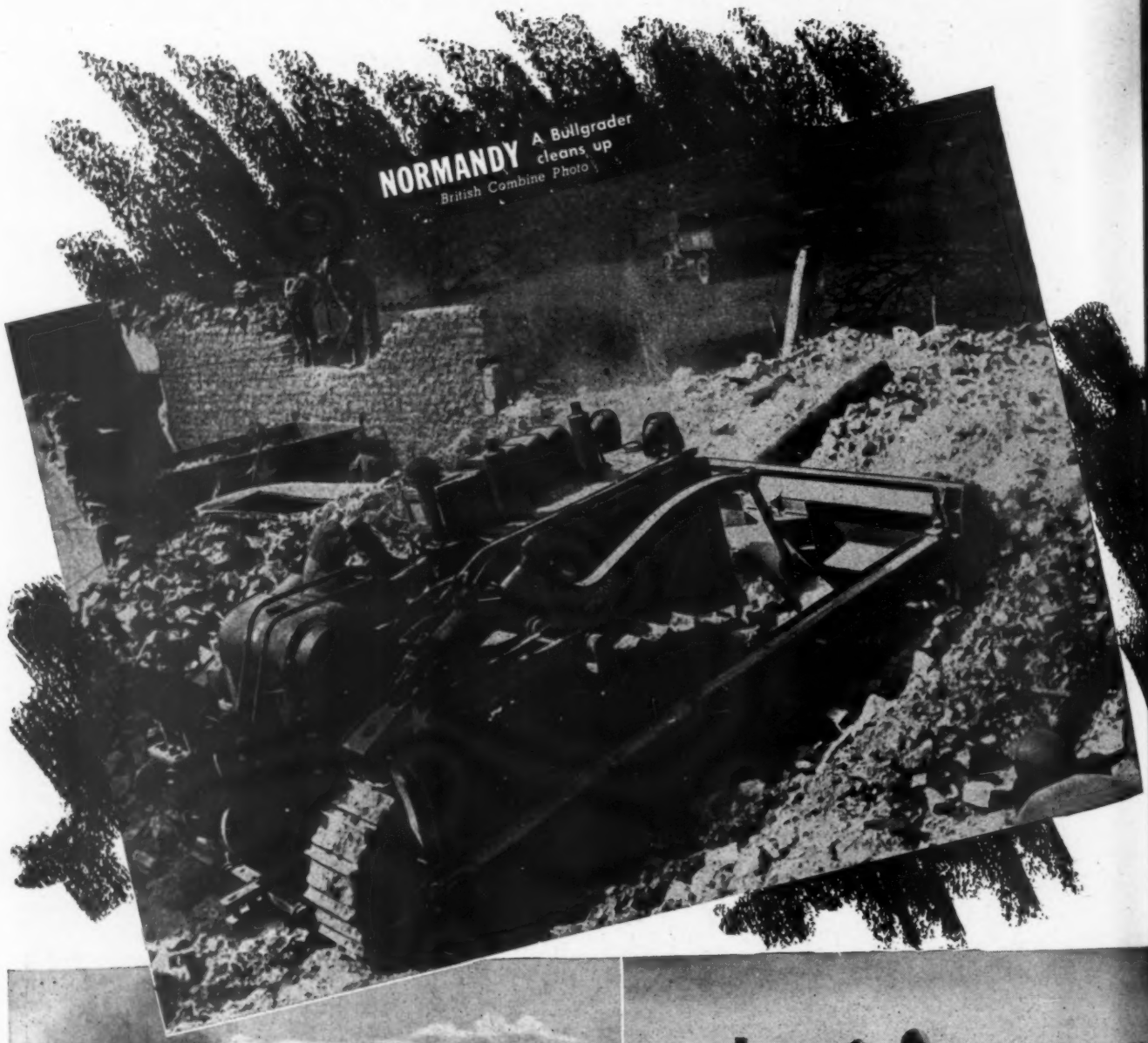
## HOW TO HELP WIN THE VICTORY . . . — AND PEACE!

- Place Idle Equipment in Essential Industries
- Make Your Machines Last By Keeping them Repaired
- Urge Completion of Plans For Postwar Projects
- Help Plan Jobs For Returning Service Men

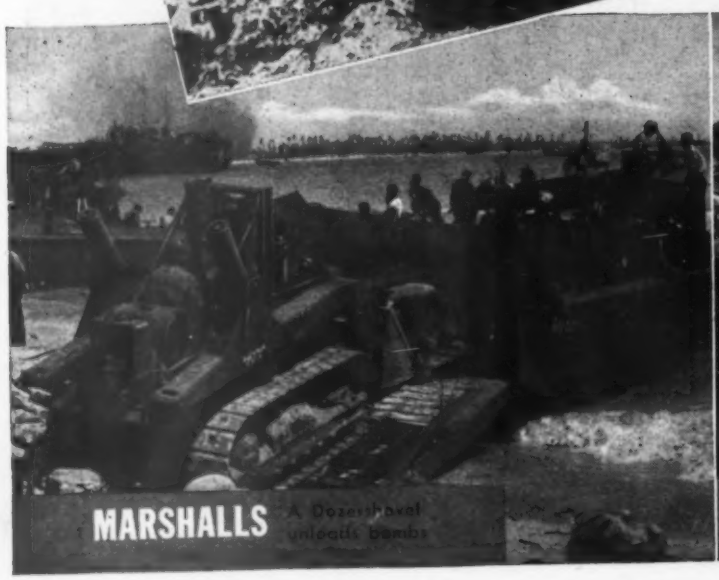
- DONATE YOUR BLOOD • TURN IN SCRAP METAL • BUY AND KEEP WAR BONDS • SAVE WASTE PAPER • NEVER PAY OVER CEILING PRICES

**ALLIS-CHALMERS**
TRACTOR DIVISION—MILWAUKEE 1, U. S. A.

# THE WEAPON THE AXIS DIDN'T HAV



**NORMANDY** A Bullgrader cleans up
British Combine Photo



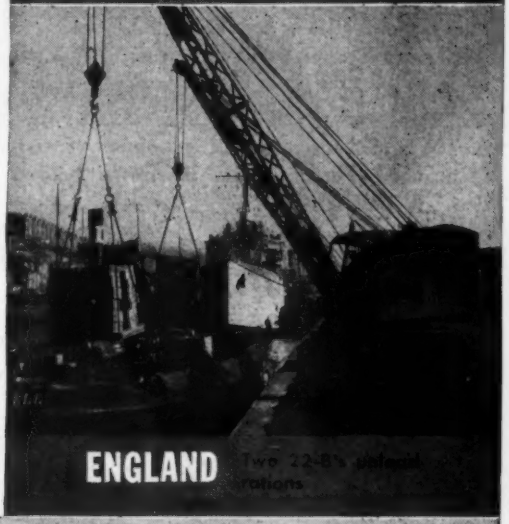
**MARSHALLS** A Dozer shovel unloads bombs

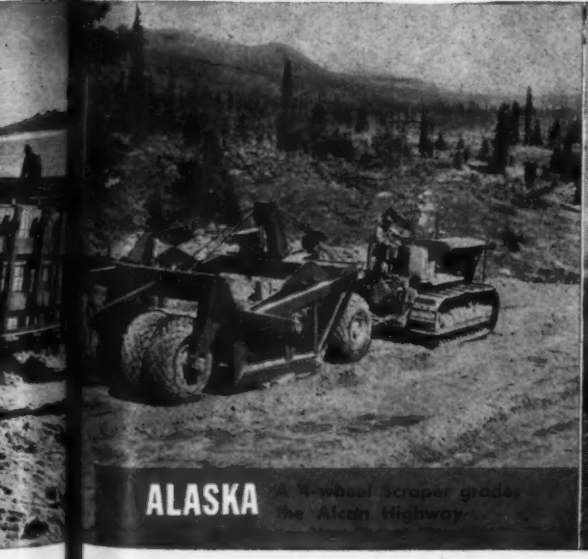
**AUSTRALIA** A Bullgrader hauls ammunition

Shovels, bulldozers, cranes, and scrapers are doing the same basic things now they did before the war. Yet our enemies, for all their years of preparation, failed almost completely to recognize the potential military value of dirt moving equipment. In the hands of American men, long accustomed to brilliant use of machines, excavating equipment is truly a double-edged sword, efficient in war and peace. V-63

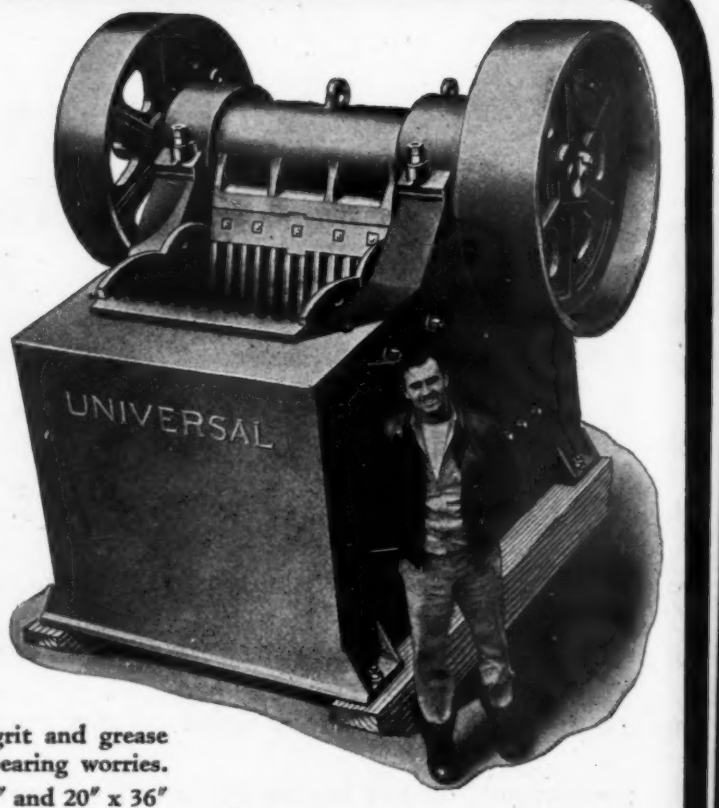
BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



# *This big bruiser is not as heavy as it looks (but it's tougher than it looks!)*




Universal has led the field in eliminating dead-weight—we've done it again with the NEW "WRB" series *welded steel plate* crushers with cast steel pitmans. Not an ounce of excess metal, yet all the structural strength necessary to prevent distortion of frame or misalignment of bearings. Lateral and transverse ribbing and heavy plate side walls assure absolute stability.

Four big SKF roller bearings—two on the pitman and one on each side—labyrinth sealed against grit and grease and Alemite lubricated, assuring freedom from bearing worries.

Two sizes available in the "WRB" series—30″ x 42″ and 20″ x 36″ feed openings; other sizes later.

A number of Universal "WRB" Crushers are in use. Users of the 30″ x 42″ report from 150 to 200 tons per hour of 4″ material. A 30″ x 42″ crusher on a primary crushing unit built for Art Overgaard, Elroy, Wisc. is shown below. Send for bulletin on the "WRB" line.

*The overhead eccentric type jaw crusher, first built by Universal in 1906, has become the most widely accepted method for primary reduction of rock and gravel. While there have been improvements in materials, bearings and construction, there has been no major improvement in this basically sound method of crushing which provides two crushing blows with each revolution of the eccentric—a preliminary blow in the mouth of the crusher and a further reduction in the throat, at the bottom of the crusher. Some of these early crushers are still in use. The Universal "WRB" series employs this original highly efficient crushing principle.*

**UNIVERSAL ENGINEERING CORPORATION**
**631 C Ave. West** **Cedar Rapids, Ia.**

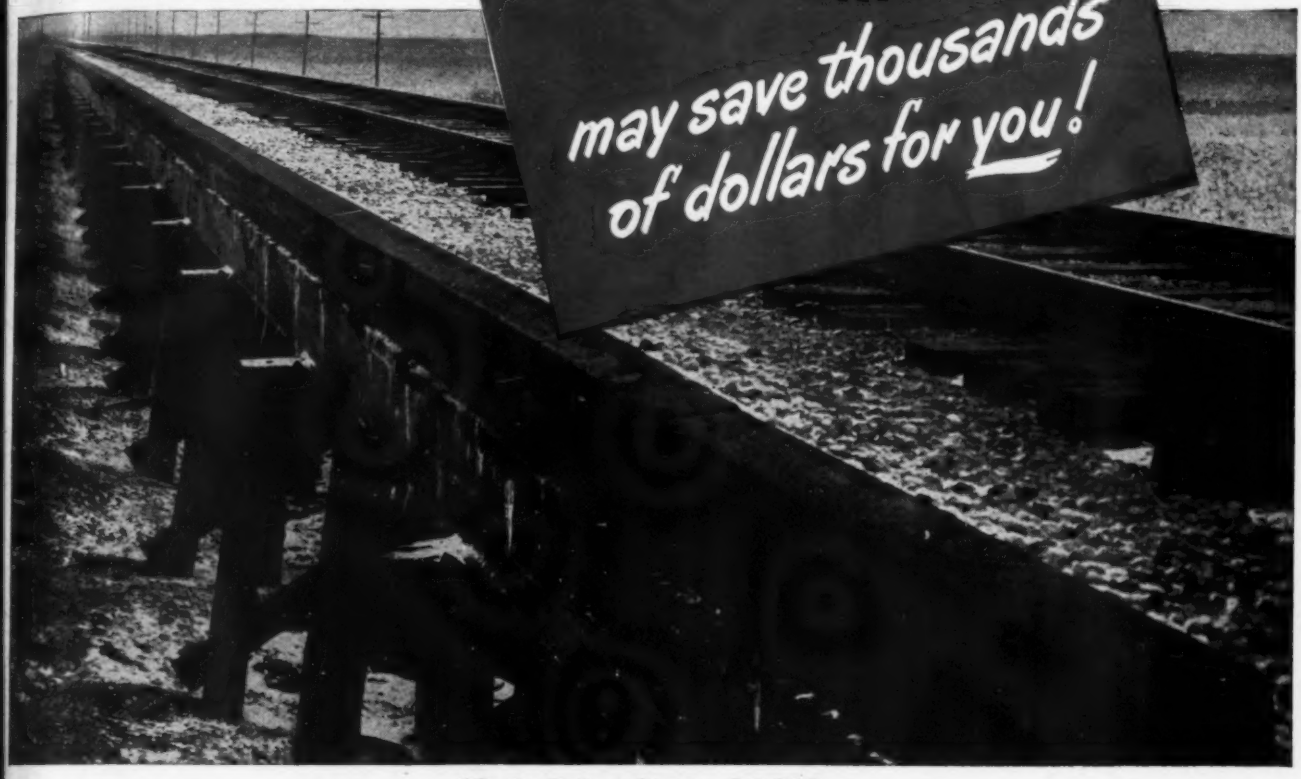
ARMY NAVY

# UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!

# THE STORY OF THIS PRESSURE-TREATED BRIDGE* may save thousands of dollars for you!



*On the St. Louis Division, B & O RR

Every engineer who is thinking in terms of permanent, economical construction, immediate or post-war, can get some food for profitable thought from the history of this 500-foot railroad bridge.

It was built in 1910, with 5 to 6 red oak piles per bent, and with a yellow pine deck. All material was pressure-treated with creosote.

In 1930 a maintenance engineer inspected the structure and found it in perfect condition. He predicted a useful life of 40 years, and on a straight-line basis estimated the total interest charges and amortization as $1910 per year. In a similar structure, built of other materials, the interest charges alone—assuming perpetual life, and no maintenance—were $3750 per year, almost TWICE the cost of the pressure-treated wood structure.

According to current engineering reports, it is only within the last five years that any serious deterioration has occurred, and only within the last two years that any considerable amount of renewals were necessary. It was stated that "The structure is still in fair condition and should not require any large expenditures for renewals or replacement for another 5 years." This will bring its age to 39.

If only a *30*-year life had been realized, the yearly interest and amortization charges would have amounted, on a straight-line basis, to $2100 a year . . . a saving of almost $50,000 for the period.

Perhaps a similar simple analysis of costs and life will point out some substantial savings-possibilities in some of the structures you are planning. Our bulletin will give you a picture-story of a few of many applications where pressure-treated wood is cutting construction time, costs, and maintenance. Ask for "Economical and Permanent Construction with Pressure-Treated Wood."

**KOPPERS COMPANY • WOOD PRESERVING DIVISION**
**PITTSBURGH 19, PA.**
**KOPPERS**

THE INDUSTRY THAT SERVES ALL INDUSTRY

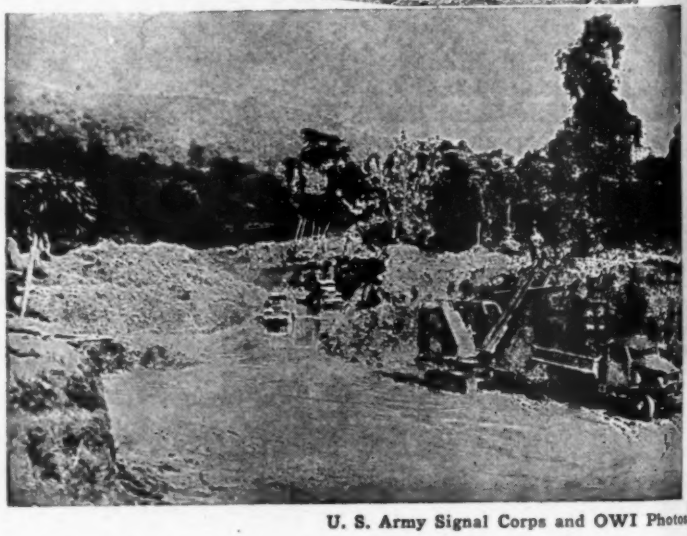
# INDIAN TRAIL TO TOKYO

*Rugged OSGOODS and Native Labor Help Army Engineers Blaze Vital Chinese Supply Line Through Burma.*

U. S. Army supply lines are inching their way across the dense jungles of northern Burma along a route known as the Ledo Road. The ultimate terminus for which our engineers are fighting and sweating, digging and building is . . . Tokyo.

Helping to clear the way and move the dirt along this virgin trail are husky, mobile OSGOOD Shovels. It's a tough job; as tough a test as you'll find for ingenious men and machines. That OSGOOD'S measure up — here as well as in battle areas all over the map — is a good thing to remember.

For someday your money, now invested in War Bonds, will be buying new equipment, and when that day comes OSGOOD power, maneuverability and durability will be ready to deliver the proven performance you want!



U. S. Army Signal Corps and OWI Photos

*Ledo Road to China — through tangled jungle, over innumerable rivers, streams and chasms, and blasted out of tree-covered hillsides —will in due time carry Allied supplies for the storming of Tokyo.*

THE GENERAL EXCAVATOR COMPANY
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

*Associated with* The General Excavator Company

OSGOOD

CRANES-SHOVELS MARION OHIO U.S.A. OSGOOD GENERAL

THE OSGOOD COMPANY • MARION, OHIO

OSGOOD
SHOVELS, DRAGLINES
CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

# AMERICA IS *Built with Aggregate!*

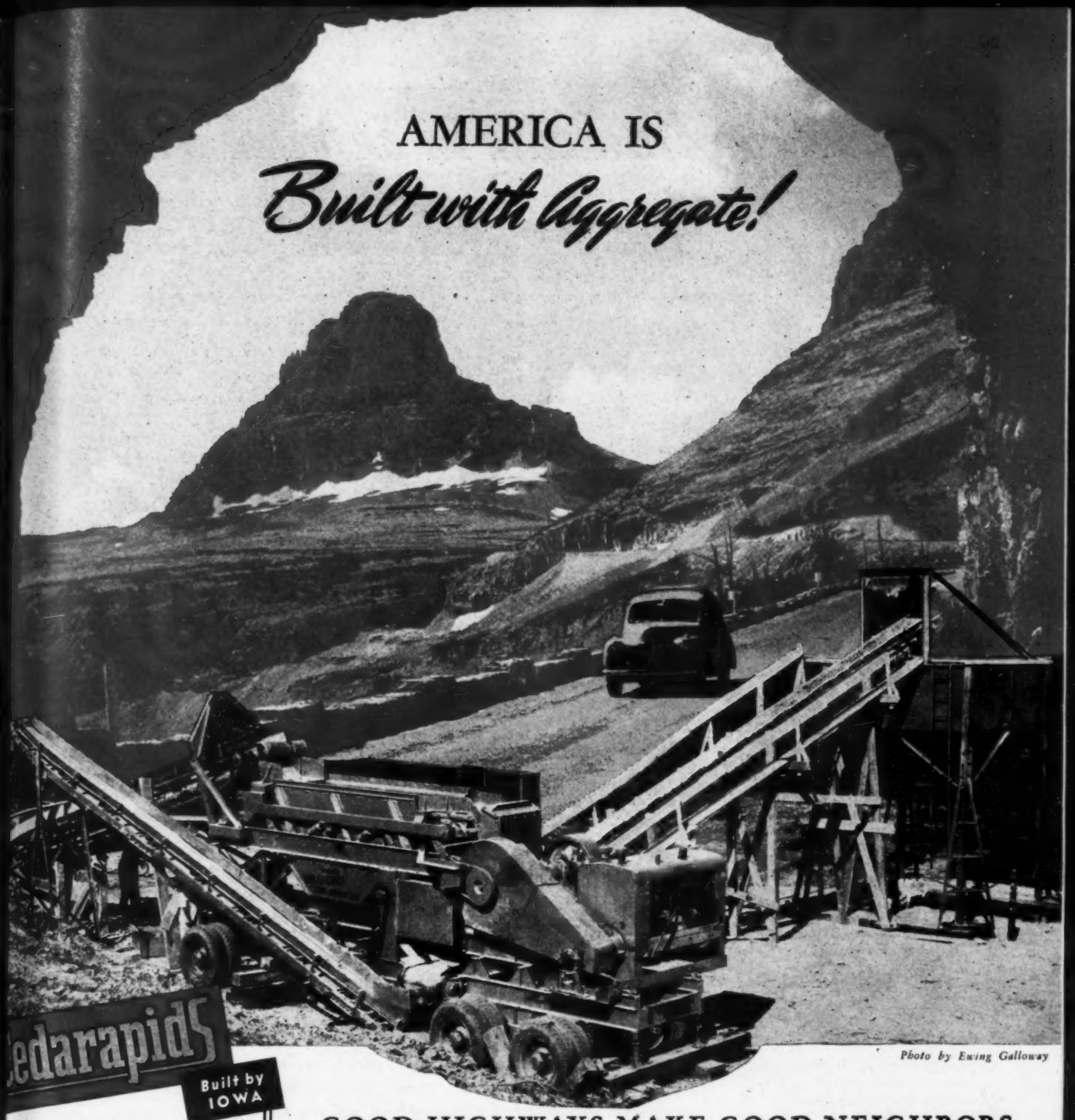



*Photo by Ewing Galloway*

## THE IOWA LINE

*of Material Handling Equipment Includes*

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

## GOOD HIGHWAYS MAKE GOOD NEIGHBORS

**Whether highways link nations together, like the Alaska Military Highway or Pan American Highways, or are the Farm to Market secondary roads, their primary object is to bring people and goods closer together. Good roads are built with aggregate, and, under the contract system of construction, are symbolic of the freedom of the American way.**

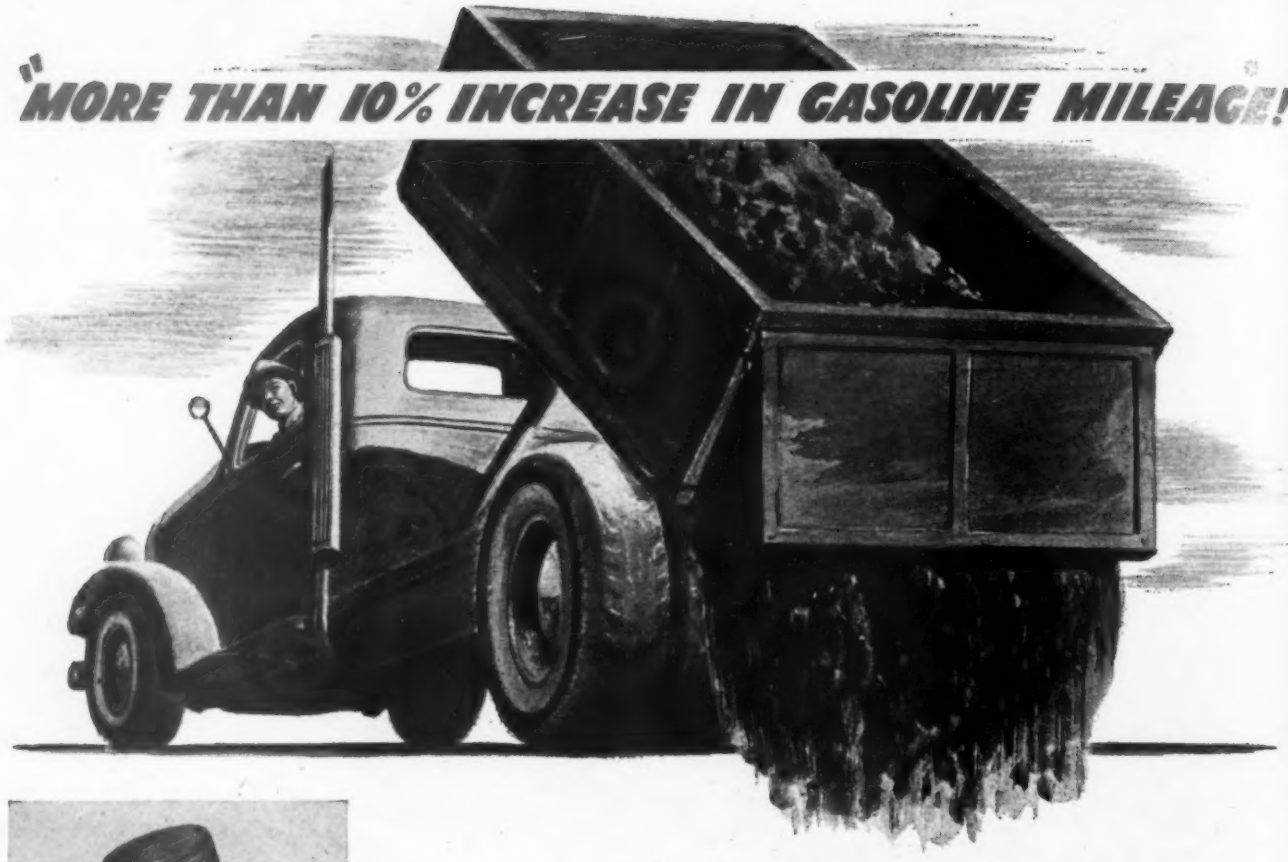
**More and more aggregate producers are finding that the production of low cost aggregates is the result of refinements in crushing equipment developed by the combination of construction "know how" and American ingenuity which produced the line of Cedarapids plants. The Iowa line ranges from single units to complete plants which can be engineered to meet any aggregate production problem.**

**Come to Iowa first, it's Headquarters for aggregate producing equipment!**

**IOWA MANUFACTURING COMPANY**

**CEDAR RAPIDS, IOWA**

# "MORE THAN 10% INCREASE IN GASOLINE MILEAGE!"



Ring-Free removes carbon. Keeps pistons clean, rings free. Reduces power loss.

Ring-Free's high film strength and long cling make bearings last longer, even under overloads.

Ring-Free holds foreign particles in suspension... stops sludge formation, reduces port clogging.

You'll move more tons of material per gallon of fuel consumed if you use Macmillan Ring-Free Motor Oil. That is a simple statement of fact, and the reasons are very easy to explain.

It takes *power* to move material. It also takes power to *overcome internal engine friction.* The more internal friction is reduced, the more power you'll have for hauling material, or other productive work.

Ring-Free Motor Oil cuts friction-power-loss materially, because it *reduces friction fast.* It lubricates better because it removes carbon, has high film strength, long cling and thorough penetration.

***TESTED AND PROVED ON THE JOB**

Operators everywhere find their engines run better and last longer when lubricated with Ring-Free. Power is increased, shut-downs and repairs are decreased. Operating and maintenance costs go down, production and profits go up.

You, too, will notice *immediate improvement* when you change to Ring-Free. Give it the hardest tests you can, on your toughest jobs. It will effectively answer many of your difficulties.

*"For the past seven years I have been using Ring-Free Motor Oil in my fleet. I get from seventy to eighty thousand miles before changing motors or being forced to make any major repairs. I never have any sticky valves and but slight traces of carbon, and my gasoline mileage has increased more than ten per cent."*

Henry J. Schafer, Jr., Pres.
*Schafer Brothers Trucking Corp.*

**MACMILLAN RING-FREE MOTOR OIL**

**MACMILLAN PETROLEUM CORPORATION**

50 W. 50th St., New York 20, N. Y.; 624 S. Michigan Ave., Chicago 5, Ill.; 530 W. Sixth St., Los Angeles 14, Calif.

Copyright 1944 Macmillan Petroleum Corp.

**MODERN bucket construction is engineered with ample margins of safety, meeting all impact requirements—*but you can still improve any bucket's wearing qualities by applications of Stoody Self-Hardening!* Hardface only those parts receiving greatest abrasion; it's more economical and it equalizes wear over the entire bucket surface by retarding rapid abrasion on the lips, runners and other points of "spot wear."**

**NEW BUCKETS** are kept in topnotch condition by hardfacing important wearing surfaces before buckets are put in service, thereby preventing wear from reaching original steel. STRINGER BEADS of Stoody Self-Hardening are an ideal means of wear protection on new buckets.

**WORN BUCKETS** are best, 1) built up with Stoody manganese electrodes or, 2) patched with manganese or high carbon steel plate. Patches should be entirely surfaced with Stoody Self-Hardening to prevent abrasion on softer steel beneath.

**Stoody Self-Hardening, an alloy of high cnromium-manganese, is ideal for protecting earth working equipment. It's easy to apply, bonds well with manganese steels, *has exceptionally high wear resistance* without the disadvantage of chipping and is economical—3/16" and 1/4" diameter rods are priced at only $.50 per lb., f.o.b. Whittier, Calif., or distributors' warehouses.**

***Last, but not least, you can get Stoody Self-Hardening almost anywhere—over 600 dealers in principal U. S. cities are at your service.***

**STOODY COMPANY**

1125 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

# STOODY HARD-FACING ALLOYS

## *Retard wear . . . Save Repair*

# "OUR TRUCKS DO TWICE AS MUCH WORK SINCE WE SWITCHED TO TRAILERS"

—J. A. MERCIER BRICK CO.

## THIS EXPERIENCED USER EXPLAINS HOW FRUEHAUF TRAILERS CUT DELIVERY COSTS

"Before we switched to Trailers for delivering brick and concrete blocks, our trucks were often tied up in the yards for loading until 10:00 or 11:00 o'clock in the morning.

"Actually, about half of each truck-and-driver's working hours were eaten up in loading time . . . because the trucks had to stand idle . . . and the best we could get was 2 to 3 round-trips a day with each truck.

**"Here are the advantages we have found with the Trailers:**

- "Our trucks now do twice as much work as they did before. They average 5 round-trips a day on deliveries up to 25 miles away . . . often make as many as 6 deliveries daily. That's because each truck leaves early in the morning with a Trailer that has been loaded the previous afternoon. While the truck is gone, another Trailer is being loaded. As soon as the truck returns, it "drops" the empty Trailer, couples up to a loaded one and starts off on another delivery.
- "Besides making more trips, the Trailers carry bigger loads. The trucks carried 3,000 bricks or 300 8-inch blocks . . . The Trailers haul 6,000 bricks or 600 blocks . . . yet these double loads are pulled by the same trucks as before. All we did was take the platform off the trucks and shorten the wheelbase.
- "Here's another point. Most of our deliveries are off the road, and we find that the shorter wheelbase truck pulling a Trailer gets through muddy stretches where trucks alone wouldn't budge.

"Everybody is pleased with the Trailers — our customers get better service — our drivers make more money since they are paid for the trips they make — and we're saving money by making more deliveries with only half as many trucks. As a matter of fact, the Trailers have worked out so well for us that we are planning to convert the remaining trucks in our fleet into truck-tractors, and switch our entire operation to Trailers, as soon as the war is over."

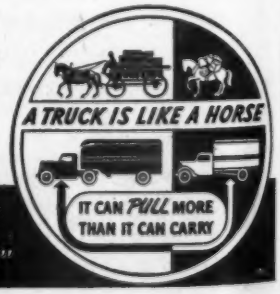
Whether you operate one or two trucks or a large fleet, it's likely that Trailers will fit into your operation, too, and save money for you. Why not call in a Fruehauf transportation engineer today and let him go over your delivery set-up with you? There is no cost or obligation for this service and it may mean a big saving.

*World's Largest Builders of Truck-Trailers*

**FRUEHAUF TRAILER COMPANY**

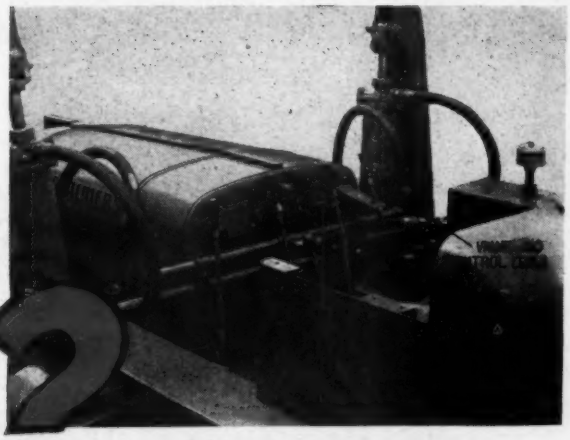
**DETROIT**

*Service in Principal Cities*




**FRUEHAUF TRAILERS** "ENGINEERED TRANSPORTATION"

# Ever Operate a BAKER?



If you did, we need not tell you how simple it is. We've been talking about direct hydraulic lift and full down pressure on the blade and about the ease and low cost of maintaining Baker bulldozers and gradebuilders. But, as a contractor who operates five Bakers pointed out to George Phares, our No. 1 field man—"Baker's ease of control is something to write home about."

Operator faces forward—no need to sit askew. Control lever is within convenient reach. Four lever positions—*float, down, hold, raise*. Fast, positive action. That *hold* is important—you can put the blade in a cut and hold it there! On many occasions, especially where the going is tough, hydraulic down pressure is the operator's "ace in the hole."

Baker Bulldozers on Allis-Chalmers 2-cycle diesel tractors are making it easier for our fighting forces on every front.

**THE BAKER MFG. CO.**
**506 Stanford Ave., Springfield, Ill.**
*"If it concerns Victory, it concerns us"*

*Top: Baker Bulldozer on Allis-Chalmers tractor clears floor of pit for buried fuel tank in South Pacific.*
*Bottom: Private Wally Saner, former Baker employee, removing snow at Alaska air base with Baker Gradebuilder which helped build base.*

BULLDOZERS SNOW PLOWS **BAKER** ARMY E NAVY CONSTRUCTION EQUIPMENT

# *Get ready*
# TO TACKLE THAT
# *$3,000,000,000 Annual Paving Job!*

**Only Multi Foote Pavers Give You All These Features**

DOUBLE CONE DRUM with its end-to-end scouring action insures a complete and thorough mix of every batch.

TROUBLE-FREE WATER SYSTEM is simple, accurate and independent of water pressure.

HIGH OPERATING PLATFORM assures greater visibility and faster, more accurate work.

ROTARY DISCHARGE takes only a quarter turn to kick concrete into the big bucket ready to speed out the long boom to be discharged.

BIG, WIDE, SOLID SKIP prevents spilling and assures fast, positive charging.

SIMPLE, RUGGED DRIVE provides fast, smooth action.

Three billion dollars worth of paving jobs will be awarded annually to the lowest bidding contractors. You can be certain to get your share if you have Multi Foote Pavers like those that have given such impressive performance on war front construction. Their records for speed and low cost are the reasons why there are more Multi Foote Pavers in service than any other make.

Big capacity for big jobs, yet profitable to use on smaller ones too. Simple, easy operation and maintenance, speed and dependability second to none, proved superior design — these are only a few of the reasons for Multi Foote leadership. Write today for details.

**THE FOOTE COMPANY, INC.**

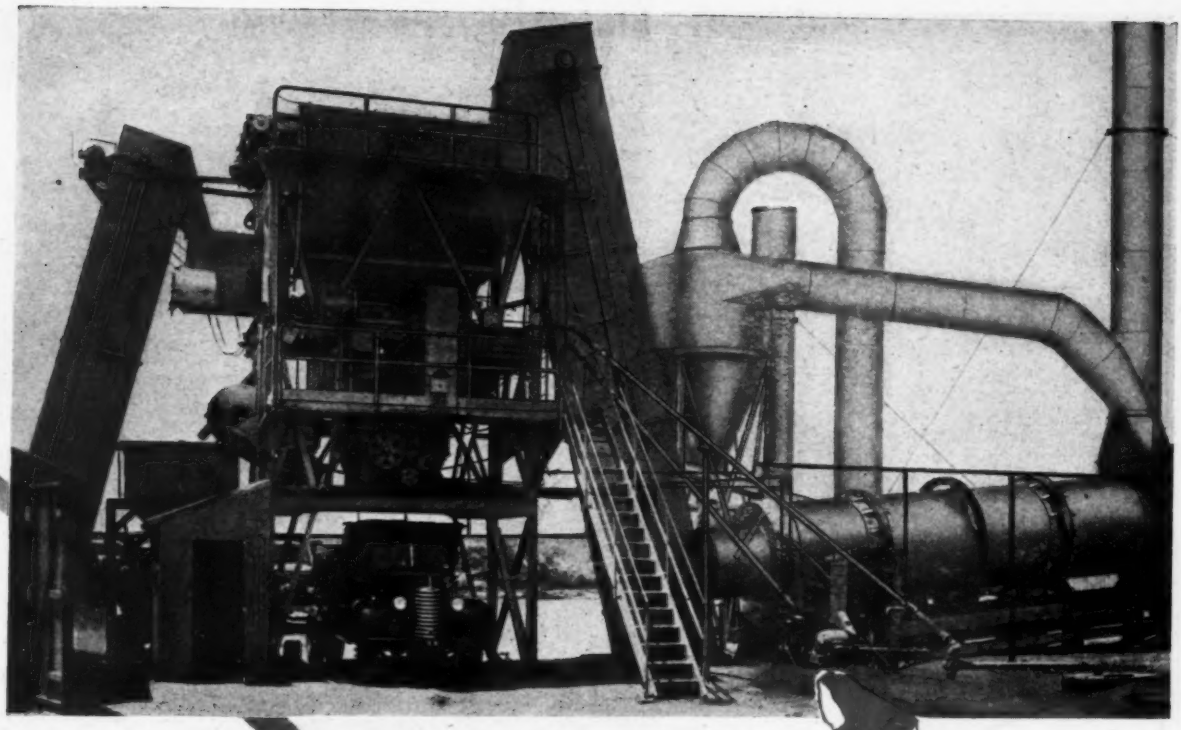
*Multi Foote Pavers Conform to A. G. C. Standards and Specifications.*

**NUNDA • NEW YORK**

*The World's Largest Exclusive Manufacturer of Concrete and Black Top Pavers.*

ARMY (E) NAVY

# MULTI FOOTE
## CONCRETE PAVERS



# Ready for the Nations Highways

## TOUGH WAR EXPERIENCE CONDITIONS EQUIPMENT FOR THE PEACE

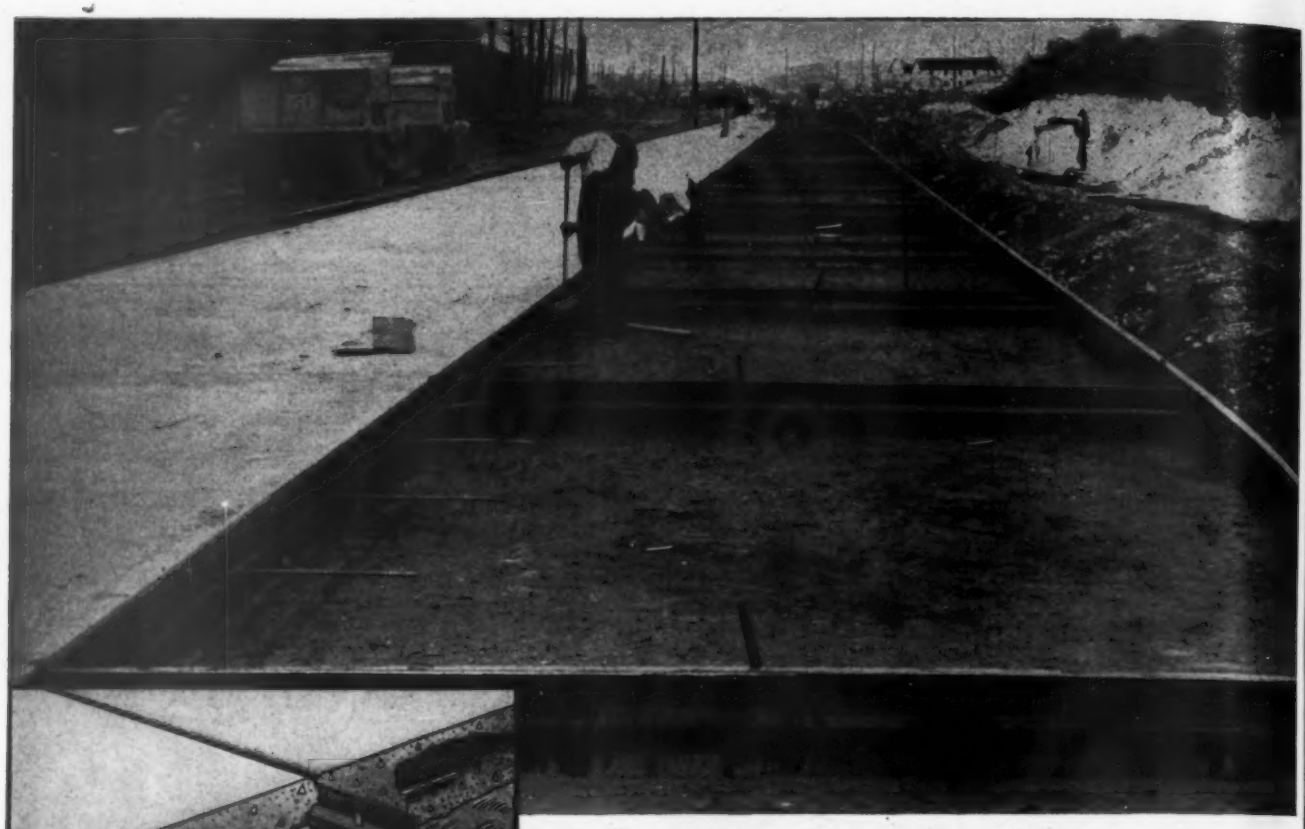
Before the war, Standard Steel's Paving Plants made outstanding production records throughout the country in bituminous road construction. With war, this equipment has played and is playing an important role in the building of many, many airports, both at home and abroad. Performance under the toughest kind of operating conditions has proved the efficiency of this equipment. Not satisfied, however, Standard Steel engineers have plans, already past the drawing board stage, for increasing even more the effectiveness of these great paving plants. It will behoove contractors to keep an eye out for Standard Steel's post-war line of road machinery.

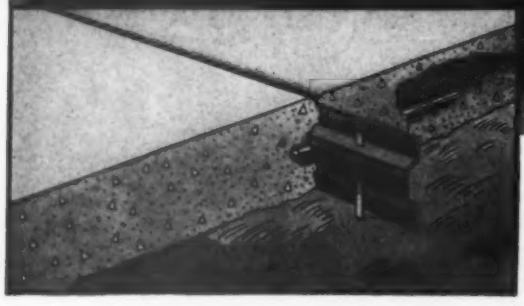
**OTHER STANDARD ROAD CONSTRUCTION EQUIPMENT: ROLLERS, SUBGRADERS, BATCHING PLANTS, DRYERS, FINISHERS, BROOMS**

**STANDARD**

**STEEL CORPORATION**

*General Offices and Plant:* 5001 South Boyle Avenue
Los Angeles 11, California





## *For Maximum Load Transmission*
## USE
## *KEYSTONE TONGUE and GROOVE JOINT*

● There are no "blow-ups", no "rough-riding" surfaces when Keystone Center Strip is used. The keyed-joint principle allows for normal expansion and contraction and distributes the load without cracking. Specify it for concrete highways, runways and industrial floor areas.

This pre-moulded asphalt mastic board joint is rigid, waterproof and flexible, and can be used both longitudinally and transversally. It's easily installed, available for immediate shipment and is approved by U. S. Engineers, Navy Department and State Highway Departments. Write for samples.

## *WHEN YOU HAVE TO KEEP COSTS DOWN....Specify*
## KEYSTONE ASPHALT MASTIC DUMMY STRIP

Where "weakened plane" type construction joints are required, Keystone Dummy Joint provides low cost, ease of handling and straight alignment without expensive installing machinery. Furnished in full size sheets—⅛" thick—and scored to the required width, it is absolutely waterproof and offers maximum rigidity.

*PAVING PRODUCTS CATALOG*... for ready reference on Keystone's complete line of paving products—engineer-approved and meeting state and federal specifications—have a copy of the Keystone Catalog in your files. Write Dept. K.

**Keystone**
ASPHALT PRODUCTS CO.
A DIVISION OF AMERICAN-MARIETTA CO.

GENERAL OFFICE
43 E. OHIO STREET . . . CHICAGO 11, ILL.
*MANUFACTURING PLANT • CHICAGO HEIGHTS, ILL.*

PREMOULDED ASPHALT AND FIBRE EXPANSION JOINTS AND ACCESSORIES.
JOINT SEALING COMPOUNDS AND CRACK FILLERS

# TODAY A JUNGLE TOMORROW A RUNWAY

WILL THEY EVER mount a Diesel Tractor alongside the cannon on a courthouse lawn to honor this great combat weapon? Anyway, it's an idea! For here's a peace-time builder that's a sensation on the battlefield, winning praises from GIs and Generals alike—moving dirt, rock, sand, frozen tundra and jungle swamp—by the ton and in a hurry.

Tens of thousands of International Tractors are serving the military—in the Army, the Navy, the Marine Corps and the Air Forces. Tractors pave the way for airpower, footpower and firepower . . . *All honor to the men who drive them!*

While these tractors are fighting on the battlefront, it's up to all tractor operators to conserve equipment here on the home front. *Make it last!* Harvester and the International Power Distributors stand ready to see you through.

If your need for new equipment is vital to the war effort, we will have equipment for you. If your need is less vital we will safeguard your present International Power with every service at our command.

And in the meantime, let's all remember that it's up to all of us to fight harder on the home front . . . fight on the food front—give to the blood bank—buy extra War Bonds—fight inflation. FOR VICTORY.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

**INTERNATIONAL HARVESTER**

*Power for Victory . . . Power for Peace*

WHEN WILL the first blizzard strike? No one knows! That's all the more reason why you should make every effort to insure early readiness—by placing your order for snow removal equipment NOW!

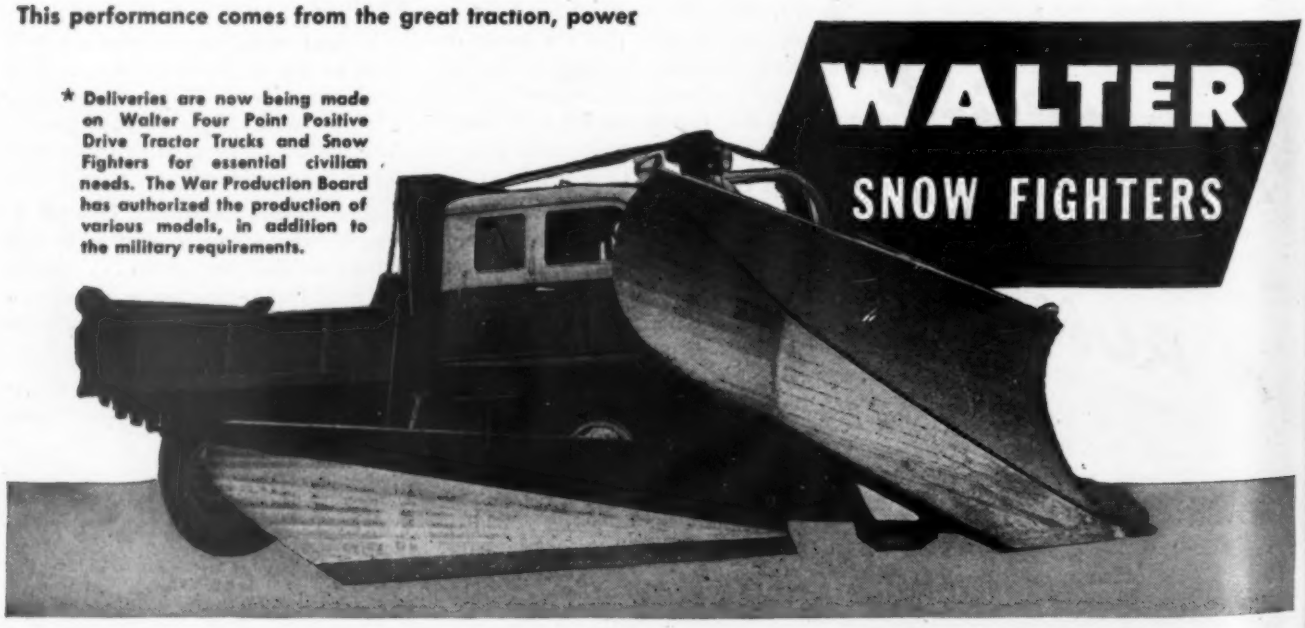
Get the facts today on powerful Walter Snow Fighters . . . proven by tests to be the fastest method of clearing highways. There are Walter models to efficiently handle every snow condition, topped by the 250 H.P. Super Snow Fighter. This unit opens a 28 ft. width in one run—smashes through road-blocking drifts—clears more miles per hour.

This performance comes from the great traction, power and speed produced only by the exclusive Walter Four Point Positive Drive. Full motor-power is delivered to each of the FOUR driving wheels according to its traction at any instant—preventing slipping, stalling and wheel-spinning.

Your first round with snow is fast approaching. Order your Walter Snow Fighters now—and you'll beat any blizzard to the punch this winter!

**WALTER MOTOR TRUCK COMPANY**
1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

★ Deliveries are now being made on Walter Four Point Positive Drive Tractor Trucks and Snow Fighters for essential civilian needs. The War Production Board has authorized the production of various models, in addition to the military requirements.



# *How capacity and tractor speed effect*

# SCRAPER PRODUCTION

For obvious reasons, the following LaPlant-Choate scraper yardage table is *not* intended for estimating specific jobs. Its main purpose is to give you a conservative measuring stick for figuring the relative advantage of higher tractor speeds, or larger scraper capacities, on various length hauls. As such, we hope you will find it helpful in estimating the size, type and number of tractor-scraper rigs you will need for your post-war dirt-moving projects. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

**ESTIMATED PAY YARDS PER HOUR WITH PRESENT LaPLANT-CHOATE SCRAPERS***

| Scraper Model | Tractor Size | Struck Yds. Per Trip | Load, Dump | Turn & Time | Length of Loaded Haul in Feet | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 250 | 500 | 750 | 1000 | 1500 | 2000 | 3000 | 4000 | 5000 |
| C-74 | D-7 | 9.5 | 2.5 | min. | 122 | 100 | 83 | 69 | 58 | 47 | | | |
| C-84 | D-8 | 13.6 | 2.5 | | 145 | 117 | 97 | 88 | 64 | 50 | 41 | | |
| C-86 | D-8** | 15.3 | 2.5 | | 175 | 130 | 109 | 98 | 74 | 58 | 51 | 46 | |
| C-104 | D-8** | 25 | 3.5 | | | 172 | 148 | 123 | 100 | 88 | 70 | 55 | 45 |
| CW-10 | DW-10** | 8.75 | 2.5 | | | 125 | 102 | 92 | 88 | 81 | 73 | 64 | 54 |

*Based on a one-way haul on level grade with good dirt and well maintained hauling roads...(54 minute hour used to allow for unpredictable losses). Above figures will change considerably depending on the type and condition of the material you are loading. They also will vary with the condition and grade of the hauling road. Proper maintenance of hauling roads increases production, decreases maintenance on equipment and gets the job done quicker.

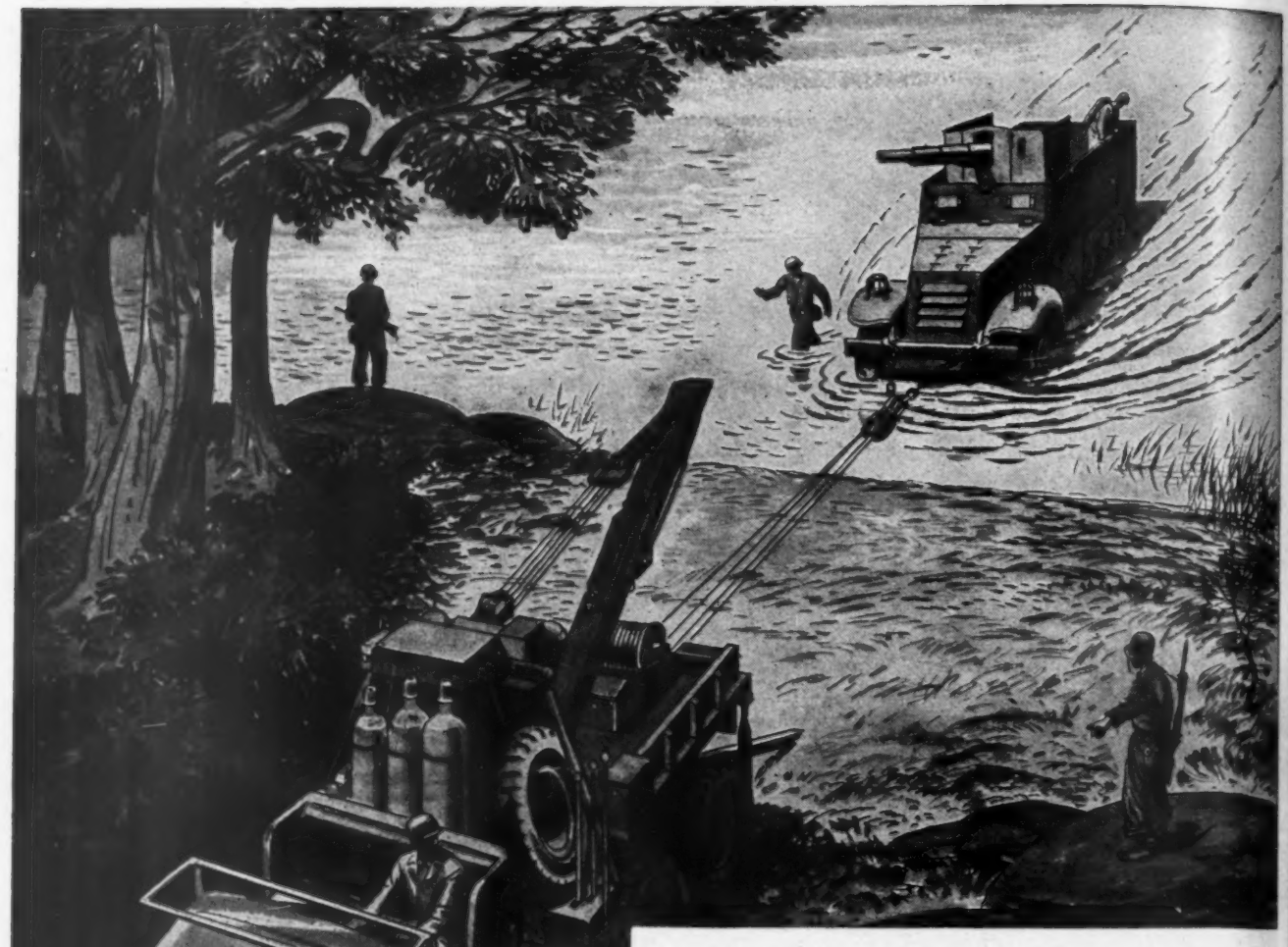
**Indicates pusher loading. In figuring operating costs per cubic yard of material on different length hauls, the operating cost of the pusher unit should be pro-rated and added to the operating cost of each scraper unit. You will find that one pusher can load 3 to 5 scrapers, depending on the length of haul.

***A Word About Tomorrow's LaPlant-Choate Scrapers***

With tomorrow's LaPlant-Choate cable scrapers, you'll be able to get full loads faster and easier in all types of soil, including sand. In addition, you can count on greatly reduced weight, lower cable expense—plus a clean, open bowl that's free of overhead obstruction, for greater stability and for easy loading under shovel, drag line, or bin.

LaPLANT-CHOATE

*Earthmoving and Land Clearing Equipment*



## EVEN A HALF-TRACK CAN'T SWIM

U. S. Army half-tracks have a well-deserved reputation for ability to plough through all kinds of trouble, but occasionally, even a half-track gets beyond its depth.

That's when they send in a hurry call for the heavy wreckers . . . giant trouble-shooting vehicles of the type our Elmira factories turn out for the Rochester Ordnance District. These versatile ten-wheel-drive monsters are equipped with cranes, winches, and special equipment that makes them equal to just about any occasion.

M-type Heavy Wreckers were designed and built to U. S. Ordnance Department specifications for military applications, and they illustrate the ruggedness and dependability shared by all trucks bearing the Ward LaFrance name. It will prove a basic economy to plan your postwar fleet of Ward LaFrance trucks, *engineered to the job*, now. Why not write our Sales Department today?

# WARD LaFRANCE

**TRUCK DIVISION • GREAT AMERICAN INDUSTRIES, INC.**

**ELMIRA • NEW YORK**

OTHER DIVISIONS: CONNECTICUT TELEPHONE & ELECTRIC DIVISION, MERIDEN, CONN. • VIRGINIA RUBATEX DIVISION, BEDFORD, VA. • RUTLAND ELECTRIC PRODUCTS DIVISION, RUTLAND, VT.

# "Dynamite" ON THE ALCAN

Up near the Arctic Circle, on the famous Alcan Highway, Marmon-Herrington *All-Wheel-Drive* converted Ford trucks "packed dynamite," literally and figuratively, to blast a cut over the heights above the Sikanni River.

"Dynamite" in each truck's four power-driven wheels, enabled them to climb rock-strewn grades too steep and too rough for conventional drive trucks to master—and dynamite in their cargoes was carried to blast a road out of the mountain side.

Hundreds of Marmon-Herringtons on this project helped drive the highway through forest, muskeg and mud. They helped haul gravel, make grades, remove snow and build bridges over torrential streams, that our Armies may have all the supplies they need to build an Alaskan stronghold.

Some of these trucks were the first motorized vehicles to break the silence of this Northern wilderness.

Wherever the going has been particularly hard, in this war, Marmon-Herrington *All-Wheel-Drive* trucks have been in the vanguard. The same advantages of power and traction, applied through all four, or all six wheels, which made these vehicles so popular in the world's most difficult civilian services, before the war, have made them equally popular with military men, everywhere. We look forward to the day when Marmon-Herringtons will shed their chevrons, and return to the works of Peace. May it not be long in coming!

★ BACK THE ATTACK . . . BUY MORE BONDS ★

## MARMON-HERRINGTON

## *All-Wheel-Drive* TRUCKS

MARMON-HERRINGTON CO., Inc., INDIANAPOLIS 7, INDIANA

Cable Address: MARTON

## *BACK OF EVERY ATTACK . . .*

# *Preformed wire rope*

Out where fighting Yanks attack, big howitzers pummel the enemy. But shells that pack a deadly wallop are too heavy for men to lift.

So a crane—rigged with Preformed wire rope—hoists the shell, then shoves it home. Every second counts. That's why the rope is Preformed. It lasts longer than ordinary wire rope. It handles faster and easier, speeding every operation. And it prevents accidents, too, because it's safer.

On the firing line—as on the production line—Preformed is proving that it's the tough wire rope for the tough war jobs.

On practically all kinds of mobile equipment, Preformed is back of every attack.

***ASK YOUR OWN WIRE ROPE MANUFACTURER OR SUPPLIER FOR PREFORMED WIRE ROPE***

# LARGE SKIP AREA

If you have idle construction equipment, make it available for home front use, where it is urgently needed. Register all your idle equipment with the local office of the War Production Board.

## EASY and QUICK BATCH SPOTTING

**High speed pouring requires high speed in every operation. Important operation in the batch cycle is the loading of the skip. Koehring Paver skips are large, streamlined, without corners, designed for flow-line charging, wide enough for easy entrance of batch truck tires. Skips have sufficient area to hold the maximum size batch without crowding. Heavy plate construction with replaceable liners and tire tread plates assure a rigid unit for batch truck loading.**

**KOEHRING COMPANY** • *Milwaukee 10, Wis.*

MEMBER MIXER BUREAU—AFFILIATED WITH A. G. C.

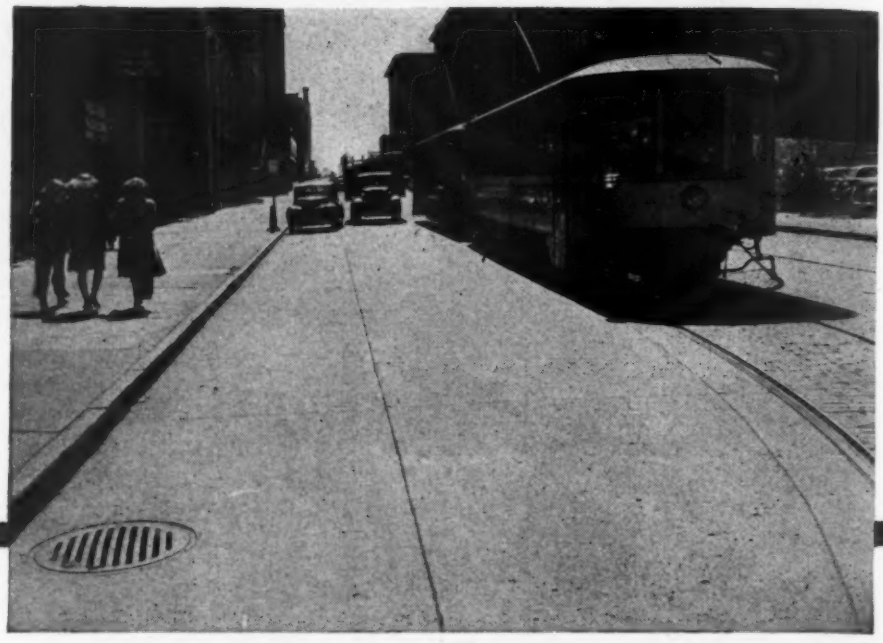
KOEHRING HEAVY DUTY

ARMY E NAVY

**HEAVY-DUTY CONSTRUCTION EQUIPMENT**

# PROVED HIGHLY SCALE-RESISTANT
## under concentrated de-icing treatments

*Minneapolis street and car-track test paving. After 5 winters of heavy applications of de-icing salts, sections laid with normal cement are badly scaled, while sections laid with Duraplastic are practically scale-free.*



**Minneapolis car-track paving made with Atlas Duraplastic* air-entraining portland cement practically scale-free after 5 winters of repeated heavy applications of de-icing salts.**

You may never have a street-car paving job; but whether you do or not, you can be sure that concrete paving made with Atlas Duraplastic will be highly scale-resistant under applications of ice-removing salts. Such applications are particularly heavy on car-tracks and switches, for these must be kept constantly open and free from ice and snow. Similar car-track paving made with Atlas Duraplastic in St. Paul, South Bend, Pittsburgh and other cities show equally satisfactory results.

These installations but substantiate the results of the original Universal Atlas test road at Hudson, New York (built 1938), and of the scores of Duraplastic paving installations now in service in more than a dozen states and cities. Many of these are now in their fourth or fifth year of service and all are practically scale-free.

For more information on Atlas Duraplastic, write to our Technical Service Bureau. Ask for reprints of articles from technical journals giving details of actual installations. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

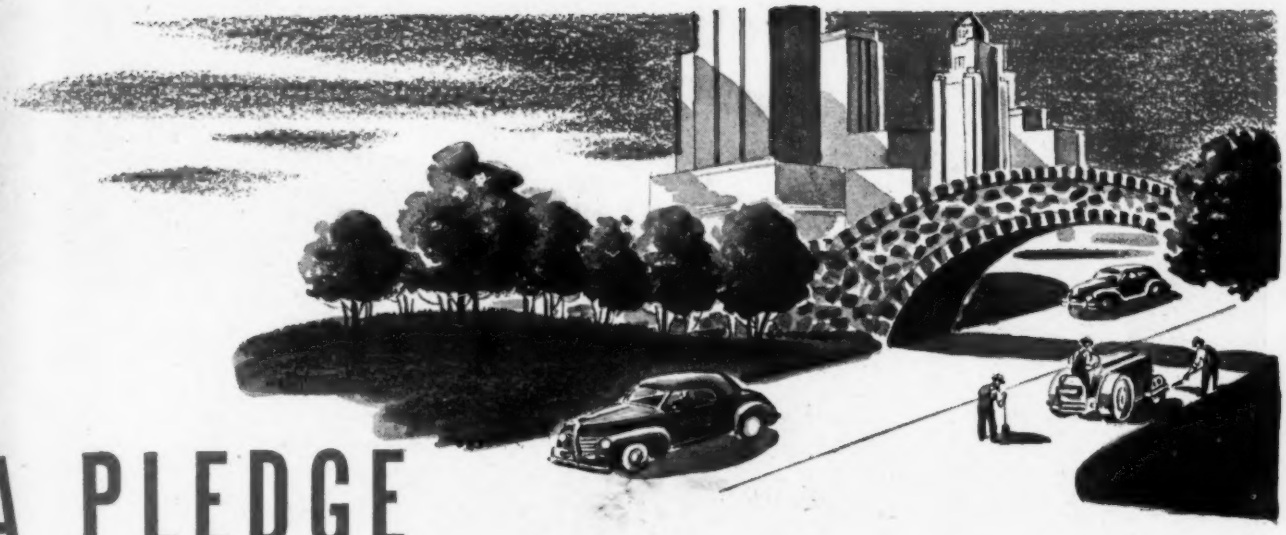
• • •

OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

RS-D-7

*Trademark registered, U. A. C. Co.; all rights reserved.

**ATLAS DURAPLASTIC CEMENT**
**A Universal Atlas Product**



# A PLEDGE

## FROM THOSE WHO BUILD HUBER ROAD MACHINERY

A trip through the HUBER plant today would reveal a modern, fully equipped machine shop and assembly lines with every facility manned by men with years of experience in building dependable road machinery. To make the most of these manufacturing facilities and talents and to insure a uniform flow of production, new methods of doing things have been adopted.

It is within these up-to-the-minute surroundings that the best work of HUBER engineers will be transformed from blueprints into highly efficient and dependable ROAD MACHINERY that will live up to the high standards of performance you have a right to expect of it.

It is the sincere pledge of those who build HUBER ROAD MACHINERY that every roller, maintainer, bulldozer, sweeper, mower and snow plow, leaving the plant, will reflect the best skill and workmanship each man has to offer — that each machine will represent the soundest and most economical investment money can buy. This, backed by practical engineering and sound management, is bound to win confidence for HUBER ROAD MACHINERY after the war.

Distributors . . . a Huber franchise may be available in your territory. Why not drop us a line?

W. F. Ehrick

Plant Manager

THE HUBER MFG. COMPANY · MARION, OHIO, U.S.A.

3 WHEEL ROLLERS · TANDEM ROLLERS
MAINTAINERS · BULLDOZERS
SPEED-SCOOPS · SWEEPERS
HIGHWAY MOWERS · SNOW PLOWS

Owners and operators of convertible MICHIGAN Mobile SHOVELS-CRANES are urged to solicit the advice of MICHIGAN engineers and distributors to keep these fast-stepping machines working at peak efficiency for the duration and after . . . Write today for Bulletin RS-64.

UNDER the stress and strain of war-time operation, machines and equipment are wearing out faster than ever before. And, after Victory, it may be some time before new equipment will be available for the "business battles" of peace. When the firing ceases the condition your machines are in may well determine your ability to successfully handle your share of post-war business. No doubt you have a machinery conservation program in effect now, but remember, its ultimate success or failure depends upon how well your operators and mechanics carry it out. Therefore, impress upon them the importance of keeping present machines and equipment in top-notch condition—for their *own* post-war well-being and security.

AIR CONTROLLED

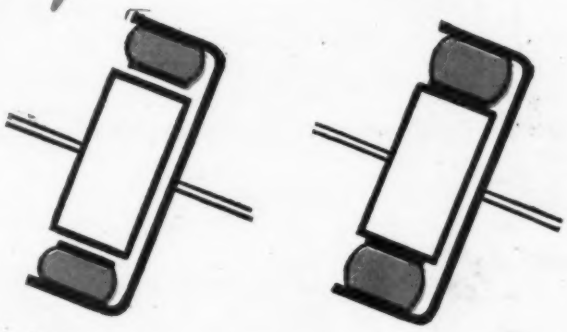
MICHIGAN

POWER SHOVEL CO.

BENTON HARBOR, MICHIGAN

# A Heavy Duty Clutch with a War Record

## *Simple · Positive · Trouble-free*



## See how it works

This is a new type of heavy duty clutch. It controls power by air pressure. It is a new—but thoroughly proved—way to transmit power from its source to the machine that does the work.

At the left you see a diagram showing the clutch disengaged. A rubber and fabric air gland, on the drive member, rolls free of the driven member.

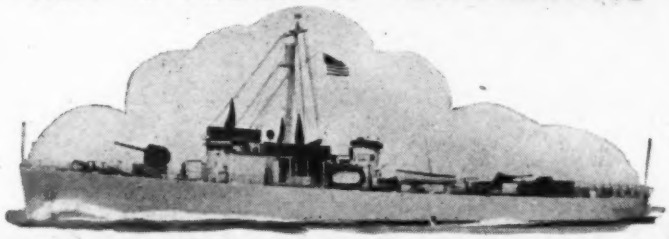
At the right, you see the gland inflated. It constricts against the driven member, to effect a clutch action that can be as light, or as firm, as you want it. Deflate the gland and the clutch is disengaged. That's the principle of the Fawick Airflex Clutch—as simple as that! It requires no levers, arms, toggles or springs—no lubrication. No adjustment—low maintenance—long service.

Ask for description booklet.

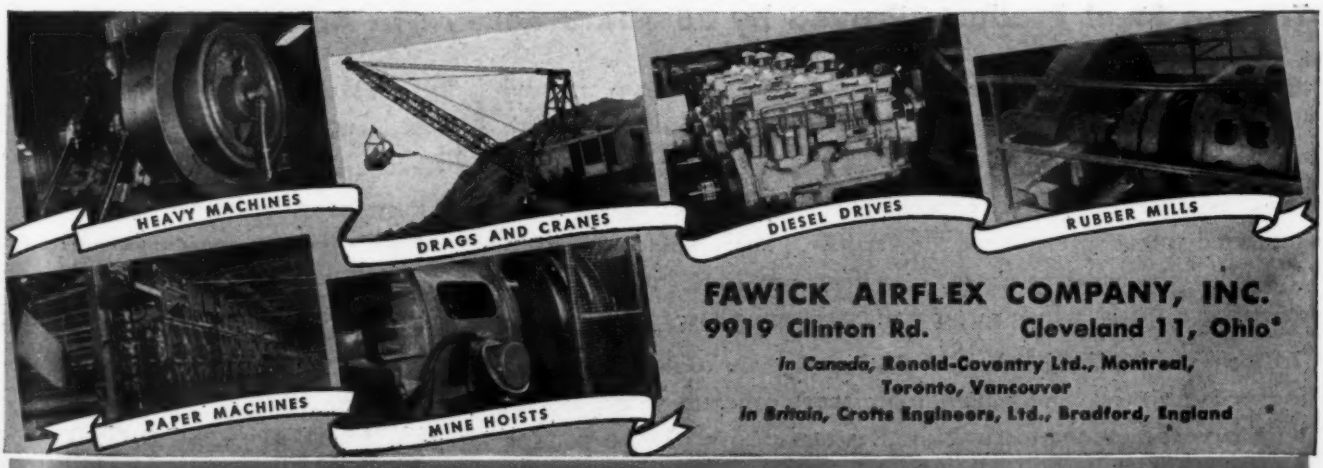
### Here is the CLUTCH that brings you *these 12 Advantages*

1. Simple in design and operation
2. Flexible control by air
3. No adjustments or oiling—low maintenance
4. Dampens vibration — absorbs shocks
5. Corrects misalignment automatically
6. Smooth starting — no jerks
7. Runs cooler — uniform pressure
8. Controls torque by air pressure
9. Greater capacity — more compact
10. Remote control by air valve
11. Replaces flexible couplings
12. Acts as clutch, slip-clutch, break and coupling.

### Here is PROOF OF PERFORMANCE



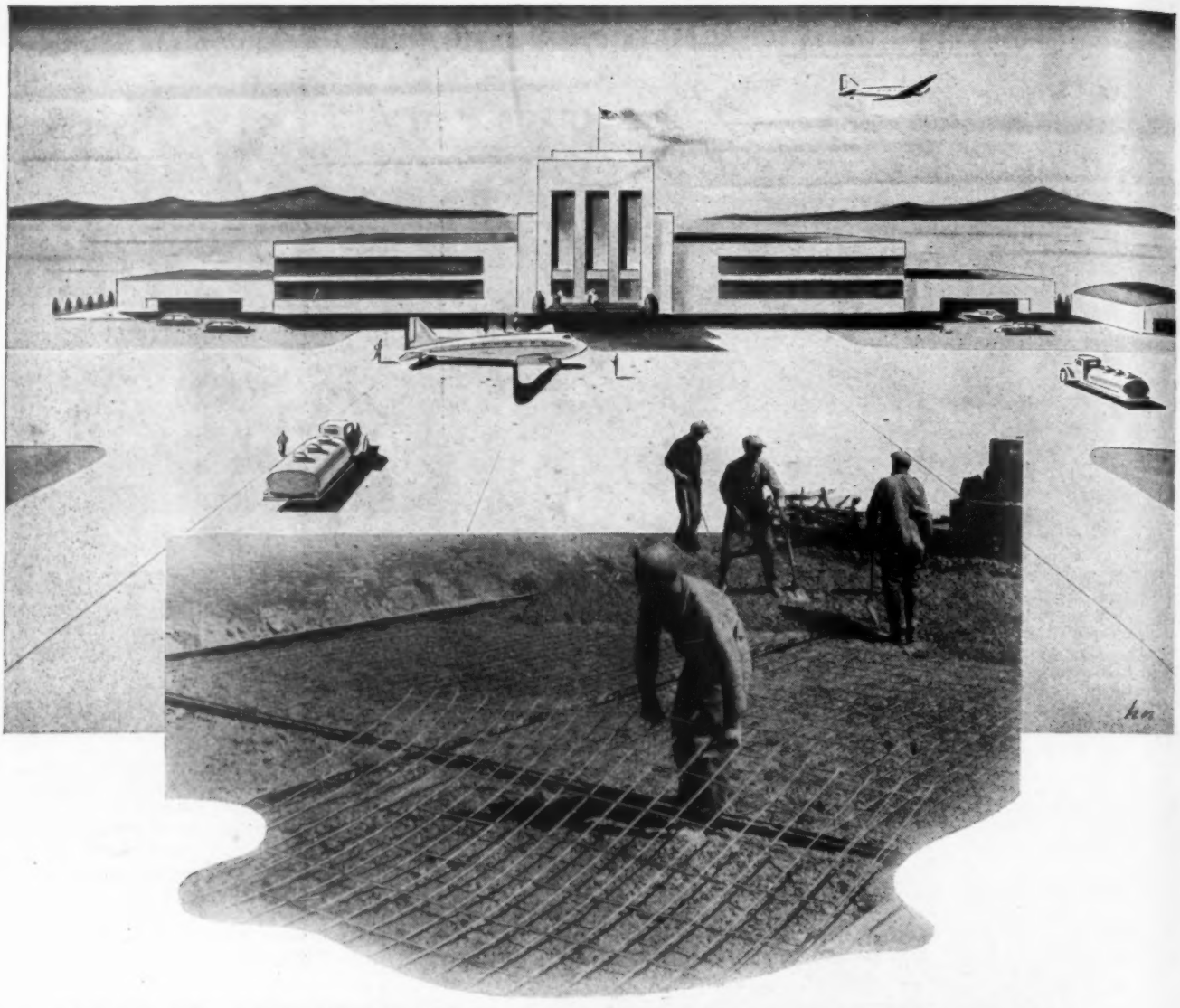
Many hundreds of vessels in the Navy and Merchant Marine are equipped with the Fawick Clutch.




**FAWICK AIRFLEX COMPANY, INC.**
9919 Clinton Rd. Cleveland 11, Ohio
*In Canada, Renold-Coventry Ltd., Montreal, Toronto, Vancouver*
*In Britain, Crofts Engineers, Ltd., Bradford, England*

# FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR



# FOR ENDURING CONCRETE RUNWAYS...

## Truscon Steel Products Proved by 25 Years Service in America's Highways

● The service demands upon concrete runways are many . . . and Truscon Steel Reinforcing Products help meet all of them with exceptional performance features.

Great expanses of concrete exposed to the elements . . . large areas subjected to convolutions of the earth . . . sharp, sudden impacts from heavily-loaded aircraft . . . these are some of the major destructive forces which airport runways must face.

Truscon Welded Steel Fabric and other Truscon concrete reinforcing products are widely used for airport concrete work, just as they have been in America's highways for over 25 years. The problems which have been solved by Truscon engineers in this highway service, and the fabricating machinery we have developed for reinforcing products, enable Truscon to give you information and products of great value.

***Truscon Welded Steel Fabric provides:***

**Resistance to cracking during setting period**

**Tensile strength against subgrade friction**

**Resistance to cracking due to warping**

**Resistance to development and opening of cracks**

**Resistance to slab separation**

**Decrease of spalling and disintegration**

ARMY E NAVY

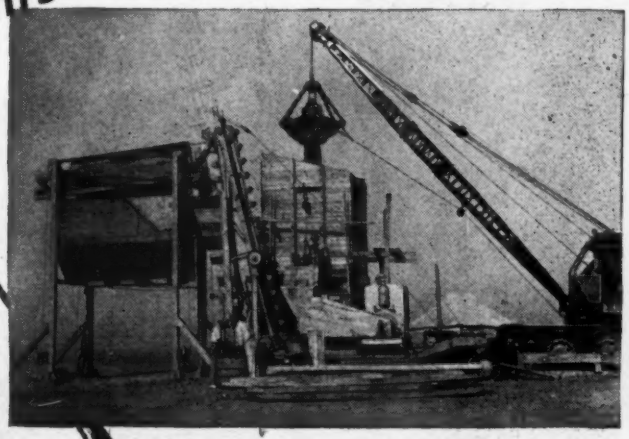
**TRUSCON**

*Steel Company*

**YOUNGSTOWN 1, OHIO**

*SUBSIDIARY OF REPUBLIC STEEL CORPORATION*

# Your LINK-BELT SPEEDER HAS GONE TO WAR On Fronts All Over The World!



These Link-Belt Speeder truck cranes are being put to work building docks, roads and bridges for U. S. Army use on the supply route through Iran to Russia. It is a grueling, difficult job—the type on which contractors have found Link-Belt Speeder's rugged, maintenance-free service of real value!

## LINK-BELT SPEEDER

*Builders of the Most Complete Line of*
**SHOVELS-CRANES-DRAGLINES**

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

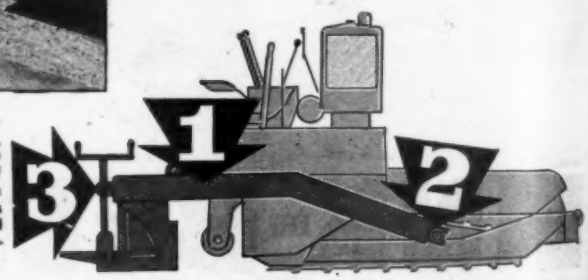
# already finished

"Wot's the use?" growls Gloomy Gus. "All day I tramp up and down and I don't get a chance to complain. No high spots; no low spots; no nuthin'; just flat pavement." That's why they call him Gloomy. Gus' job is to find the bad spots —the spots that are not level; that have to be patched up. Gus is not the final judge, though. The guy that drives across the stretch ten years after you leave is the real critic. He knows even better than Gus how good a job you did. Most jobs look good when you first put them down. How do they look ten years later?

Left: B-G Asphalt Finisher laying top course even with top edge of gutter.

The Leveling principle on the Barber-Greene Finisher is one of the many features that assures a smooth riding road. The Tamping action assures a long life for that smoothness. Unevenness and abrupt changes in the sub-base and base become a smooth flowing of the pavement. The mat smoothly rises and falls to meet the general contour of the roadway.

44-10




The profile view at right, with sideplate removed at spreader screws, shows the Leveling Arm principle. This arm (1) is attached to the screed unit at the rear of Finisher, much like a rake handle is attached to the raking teeth. The extreme end of the rake handle, or Arm, is attached to the tractor unit (2). A rise or fall of several inches of the crawlers is therefore reflected only slightly on the screed plate. Try this action yourself with a rake. To make changes in mat thickness, the rear of the screed plates are screwed up or down by the control (3) at the opposite end of the Arm. The screed then gradually rides up to increase or cuts down to decrease the mat thickness. Catalog 879 clearly illustrates this operation.

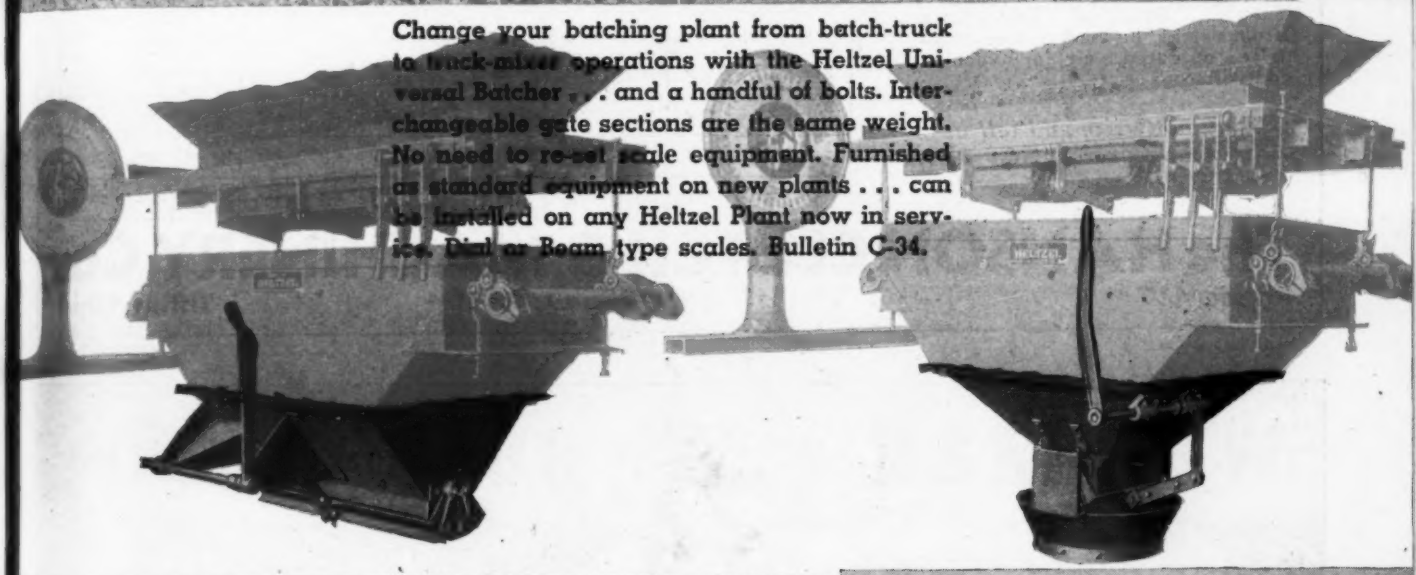
ARMY E NAVY

**BARBER GREENE**

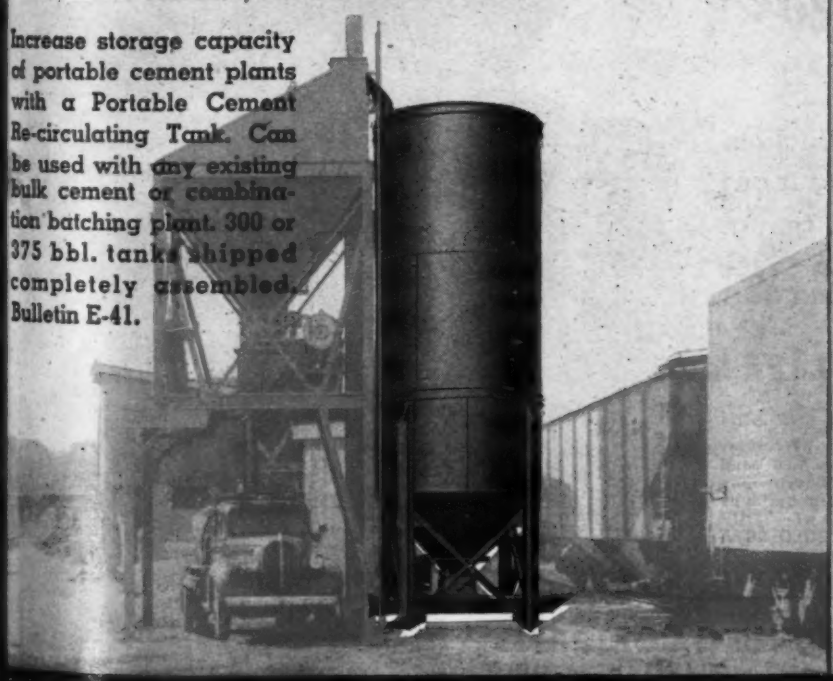
AURORA, ILL., U. S. A.

# THREE WAYS HELTZEL Can Help You With Post War Concrete Construction

Build 15-inch Airport Landing Strips and 10-inch Aprons and Parking Areas with a single set of forms. A wide range of sizes from 10 x 11 to 20 x 24 . . . use either dimension for the vertical height. Bulletin B-19-A.



Change your batching plant from batch-truck to truck-mixer operations with the Heltzel Universal Batcher . . . and a handful of bolts. Interchangeable gate sections are the same weight. No need to re-set scale equipment. Furnished as standard equipment on new plants . . . can be installed on any Heltzel Plant now in service. Dial or Beam type scales. Bulletin C-34.



Increase storage capacity of portable cement plants with a Portable Cement Re-circulating Tank. Can be used with any existing bulk cement or combination batching plant. 300 or 375 bbl. tanks shipped completely assembled. Bulletin E-41.

Other Heltzel Concrete Construction Equipment for Greater Production . . . Lower Costs.

Truck Mixer Charging Plants . . . Central Mixing Plants . . . Portable, Semi-Portable or Stationary Bulk Cement Batching Plants or Tanks . . . Steel Storage Bins . . . Concrete Buckets . . . Steel Road Forms . . . Steel Street Forms . . . Portable Batching Bins . . . Joint Installing Machines and Materials.

## HELTZEL Steel Form & Iron Co., Warren, Ohio

# HANSON

MACHINERY TRAILERS

Semi or Full — 6 to 60 Ton Capacity

Outstanding in the design of the HANSON TRAILERS are the strength and rugged construction of the trailer frame. Steel beams extend full length of frame and are supported by cross members and gusset plates which brace the frame and help to distribute load evenly throughout frame members. The goose neck is so designed that front axle mounting can make full right angle turn. Oscillating rear axles reduce road shock of both the trailer and the machinery being transported to a minimum as the wheels conform to the contour of the road and maintain a uniform platform level impossible to obtain with rear spring construction. Timken Taper Bearings throughout. Brakes may be had, either manually operated, air or vacuum controlled.

*Why not write and tell us your requirements?*

**TRAILER SPECIFICATIONS**

| MODEL | Capacity | Platform Width | Platform Length | Platform Height | Platform Thickness | Tires Front | Tires Rear | Axles Front | Axles Rear | Front Springs | Ground Clearance | Weight Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-6 | 6 Tons | 7' 6" | 12' 0" | 30" | 2" Ash | 2-10 ply 7.50x15 | 4-8 ply 7.50x15 | 2¾" | 3" | 2 3"x42" 14 lvs. | 16" | 6400 lbs. |
| P-8 | 8 Tons | 8' 0" | 13' 0" | 30" | 2" Ash | 4-8 ply 7.50x15 | 4-10 ply 7.50x15 | 2¾" | 3" | 2 3"x42" 14 lvs. | 16" | 7300 lbs. |
| P-10 | 10 Tons | 8' 0" | 14' 0" | 30" | 2" Ash | 4-8 ply 7.50x15 | 8-8 ply 7.50x15 | 2¾" | 3" | 2 3"x42" 14 lvs. | 16" | 8200 lbs. |
| P-12 | 12 Tons | 8' 0" | 15' 0" | 30" | 2" Ash | 4-10 ply 7.50x15 | 8-8 ply 7.50x15 | 3" | 3½" | 2 3½"x42" 14 lvs. | 15" | 9300 lbs. |
| P-15 | 15 Tons | 8' 0" | 16' 0" | 33" | 2½" Ash | 4-12 ply 9.75x24 | 8-10 ply 7.50x15 | 3½" | 4" | 2 3½"x42" 14 lvs. | 15" | 12500 lbs. |
| P-15 W | 15 Tons | 9' 0" | 16' 0" | 33" | 2½" Ash | 4-12 ply 9.75x24 | 8-10 ply 7.50x15 | 3½" | 4" | 2 3½"x42" 14 lvs. | 15" | 13300 lbs. |
| P-20 | 20 Tons | 9' 0" | 18' 0" | 34" | 2½" Ash | 4-12 ply 10.50x24 | 16-8 ply 7.50x15 | 4" | 4½" | 2 3½"x46" 16 lvs. | 15" | 15200 lbs. |
| P-25 | 25 Tons | 9' 6" | 18' 0" | 34" | 3" Ash | 4-16 ply 12.75x20 | 16-8 ply 7.50x15 | 4" | 4½" | 2 3½"x46" 16 lvs. | 12" | 17400 lbs. |
| P-30 | 30 Tons | 10' 0" | 20' 0" | 25" | 3" Ash | 4-16 ply 13.50x20 | 16-10 ply 7.50x15 | 4½" | 4½" | 4 3½"x46" 16 lvs. | 10" | 20200 lbs. |
| P-40 | 40 Tons | 10' 0" | 20' 0" | 28" | 3" Ash | 4-16 ply 13.50x24 | 16-10 ply 9.00x15 | 4½" | 4¾" | 4 3½"x46" 16 lvs. | 10" | 22000 lbs. |

## The HANSON CLUTCH & MACHINERY Co.

**Phone 417** — **Tiffin, Ohio**

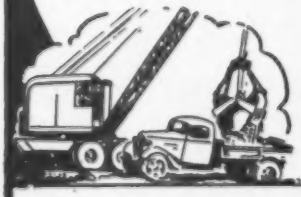


# WELLMAN WILLIAMS TYPE BUCKETS

*Staying Power*

Wellman Buckets stay right in there slugging it out in the toughest, roughest going.

**WELDED** ROLLED STEEL CONSTRUCTION is one big reason for **LONGER BUCKET LIFE!**



*Send for Free Bulletin*

Tell us about your particular requirement and we will send full description of construction and special features in bulletins which clearly proves why YOUR NEXT BUCKET SHOULD BE A WELLMAN-WILLIAMS.

Multiple Rope & Power Arm Types
Dragline • Power Wheel • Dredging
Special Service Buckets
⅜ to 16½ Yd. Capacities

**THE WELLMAN ENGINEERING COMPANY**

7003 CENTRAL AVENUE — CLEVELAND 4, OHIO

*Sales and Service Agencies in principal cities*

BUY MORE
WAR BONDS

# FWD "TRUCK-POWER" HELPS SOLVE SHORTAGES OF MAN-POWER

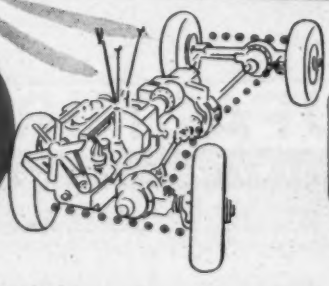
The rigors of war transportation of men and matériel are placing heavy additional strains on highways. At the same time, less manpower is available for vital road-maintenance work. Maintenance equipment, therefore, must carry an extra load of responsibility to keep roads serviceable for the duration.

The many heavy-duty road jobs done by FWD "Truck-Power" help to release manpower for other necessary work. FWDs render all-year-round service in maintaining and re-constructing roads...scarifying, grading, compacting, hauling heavy materials and equipment, removing snow and ice, and doing many other jobs faster, cheaper and better, because all four wheels of FWDs have proper power and traction. . . . To keep existing FWD "truck-power" at its best, see the nearest FWD Branch or Dealer for maintenance service.

**THE FOUR WHEEL DRIVE AUTO CO.**
**Clintonville, Wisconsin**
*Canadian Factory: KITCHENER, ONTARIO*

***These two FWD model HG highway trucks perform all-year service for Waupaca County, Wisconsin, maintaining roads in spring, summer and fall; plowing snow in winter.***

FWD TRUCKS

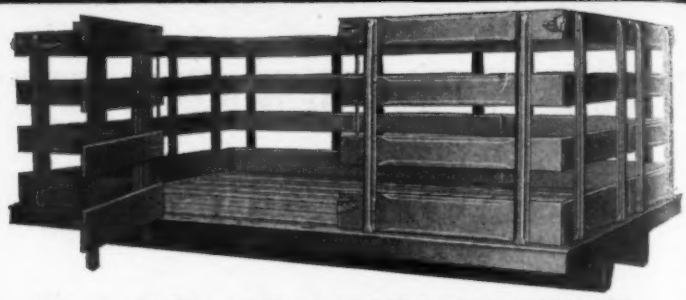


Oldest and original exclusive builders of Four-Wheel-Drive Trucks...famous for power and savings in tires, gas, oil, replacements.

Outstanding "Service Records" in Commercial—Construction—Utilities—Oil Fields—Industrial—Heavy Duty Work.

## Improved Features of Construction

"SERIES 7400" STEEL PLATFORM STAKE BODIES



FOR ALL MAKES AND MODELS OF TRUCKS

1. Rolled edge pressed steel side and end rails for increased strength and rigidity.
2. Tapered bolsters—Pressed channel section—for better wheel clearance and lower mounting height.
3. Adjustable pressed steel sills for easier installation on various chassis widths.
4. Design of steel sections reduces weight and increases load carrying capacity without loss of strength.
5. Understructure consisting of side and end rails, bolsters, braces, and gussets, arc-welded to form an exceptionally strong sub-frame.

Keep in touch with our Distributors—write for the names of those nearest you.

THE PERFECTION STEEL BODY CO. — Galion, Ohio

ARMY E NAVY

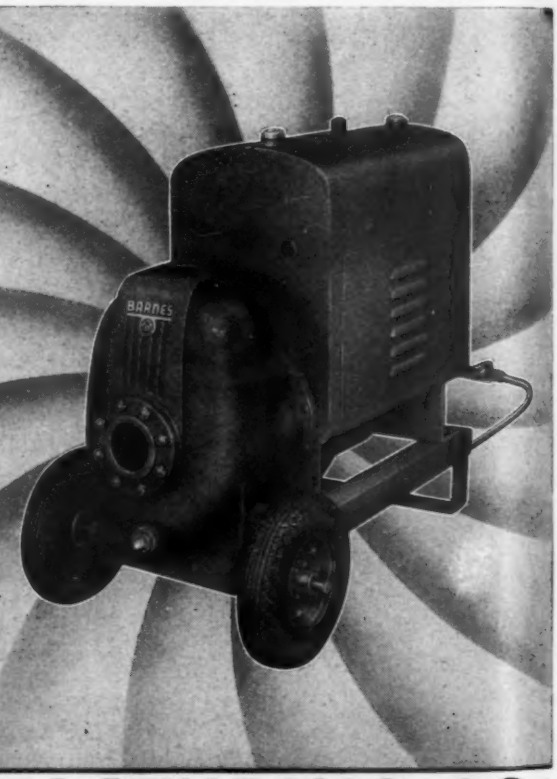
# PERFECTION

TRUCK BODIES AND HOISTS

## Your Pump for TOMORROW is ready TODAY.

Out of the stepped-up tempo of war demands for greater pump performance has come this new and finer product for the future – and you don't have to wait 'til after the war to get it. Newly designed and engineered to deliver more gallons of water for your pumping dollar. Stream-styled by one of the nation's foremost industrial designers. You'll want to learn more about the outstanding qualities of BARNES amazing NEW LINE OF SELF-PRIMING CENTRIFUGAL PUMPS.

*DISTRIBUTORS: A number of distributor's territories are still available. Write, wire or phone.*




ARMY E NAVY

# BARNES MANUFACTURING CO.

*Quality Pump Manufacturers for Nearly 50 Years*

MANSFIELD, OHIO

## UNTIL THE LAST JAP IS CLEANED UP

**the BYERS shovel or crane you'd like to buy now is helping to clean them up**

*In the meantime,* owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.

For crawler, truck mounted or self-propelled models of shovels and cranes in the portable sizes, see your nearby Byers distributor.

**BYERS** CRANES AND SHOVELS
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

## When There's No Time for Breakdowns, It's Time to Get a Gorman-Rupp Pump

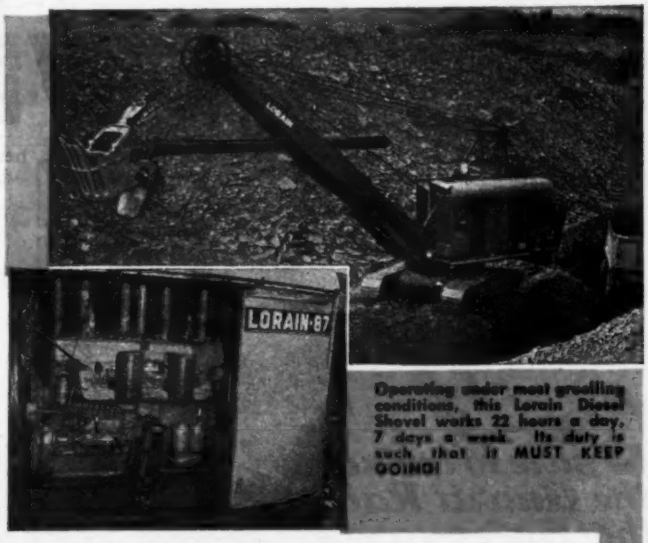
Today, when time is the essence, you need a Gorman-Rupp Self-Priming Centrifugal Pump more than ever. There is not a quitter among them. The water passage has the same area as the suction hose. Muck, gravel, cinders—you simply can't clog them because solids cannot accumulate. There is no recirculation orifice to clog—no shut-off valve to jam—no hand priming regulator. There isn't a self-priming centrifugal pump made that will outwork a Gorman-Rupp in gallonage or continuous hours. Gas engine or electric motor driven. Capacities up to 125,000 GPH. There is a type and style to fit your every requirement. Stocked for immediate delivery in 100 principal cities.

**THE GORMAN-RUPP COMPANY**
MANSFIELD - - - - - - - OHIO

**GORMAN-RUPP**
SELF-PRIMING CENTRIFUGAL PUMPS

# *Clean Fuel Oil Here* IS A MUST

## . . . and a Briggs Fuel Oil Filter showed that it could be done!




Operating under most gruelling conditions, this Lorain Diesel Shovel works 22 hours a day, 7 days a week. Its duty is such that it MUST KEEP GOING!

Close-up of the Waukesha Hesselman 125 HP engine showing installation of Briggs F-10 Fuel Oil Filter.

Two important facts are brought out in this Briggs Fuel Oil Clarifier installation. One—clean fuel oil DOES make an appreciable difference in operating efficiency and maintenance costs. Two—Briggs Oil Clarifiers can do the job and do it well!

In this installation, no trouble due to dirty fuel has been experienced since the Filter was installed two years ago. Prior to that time, new injectors were installed every year. Refills are changed every 2000 operating hours. Sediment bulb has been cleaned only once in this time.

Such efficiency is worth many times the cost of a Briggs Fuel Oil Filter!

Check the maintenance costs on your internal combustion engines. If they show excessive expenditures for new injectors . . . if they show lost time for fuel system cleaning . . . see the Briggs representative in your locality. There is a Briggs Fuel Oil Filter that will meet your requirements . . . whatever the size and type of your engine.

**Briggs**
PIONEERS IN MODERN OIL FILTRATION

**BRIGGS CLARIFIER COMPANY**
GENERAL OFFICES, WASHINGTON 7, D. C.
*DISTRIBUTORS IN PRINCIPAL CITIES*

# PERFORMANCE
## Packed with POWER

Abundant power with means of applying it efficiently to every need, is a feature of both U.S. aircraft and Owen Buckets.
In Owen Buckets power may be utilized with most efficient performance in every situation through adjustable counterweights and adjustable reeving. Investigate

THE OWEN BUCKET CO.
BREAKWATER AVE. CLEVELAND, O.
BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

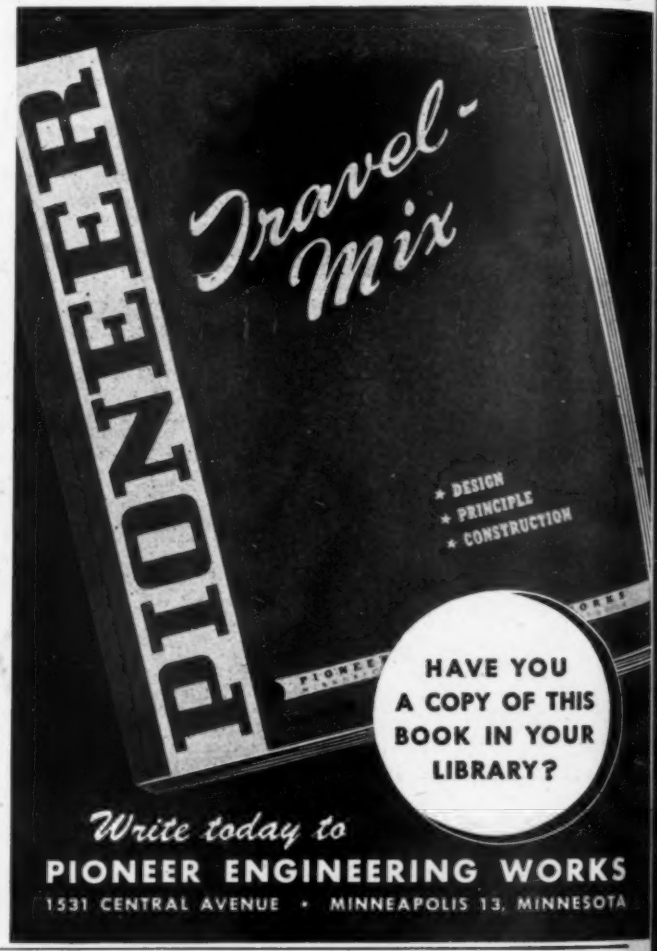
# OWEN BUCKETS
A MOUTHFUL AT EVERY BITE

DESIGNED for Safety, the TUTHILL Guard Rail is known and used by leading Safety Engineers. Convex design, sturdy construction; strong, low mounting; greater visibility; deflective action—are features that insure the type of safety that will be needed with the return of peace and the advent of higher speeds. (*TUTHILL is now available for maintenance and repairs*). Request further details.

TUTHILL HY-WAY GUARD — The Spring Cushions the Shock

Pacific Coast Distributors: U.S. Spring & Bumper Co., Los Angeles.

TUTHILL SPRING COMPANY
761 POLK ST...CHICAGO 7 ILL.



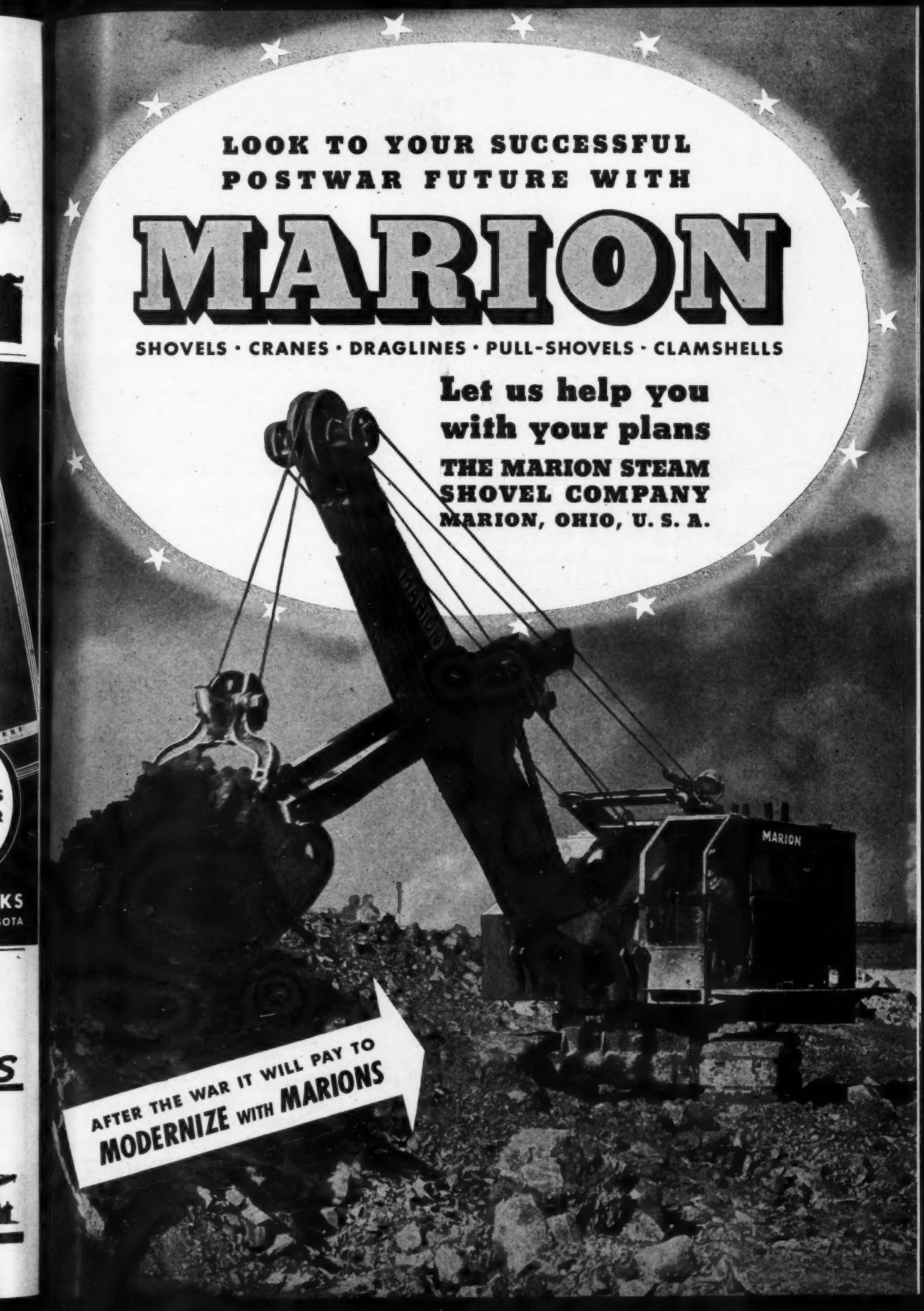

*Write today to*
PIONEER ENGINEERING WORKS
1531 CENTRAL AVENUE • MINNEAPOLIS 13, MINNESOTA

AMERICA'S shipbuilding industry will launch more ships in 1943 than all the rest of the world combined.
ROGERS TRAILERS are a vital link in the mass-production method of ship construction for they are transporting heavy machinery . . . boilers, bulkheads, engines . . speeding Victory ships down to the sea!

## on ROGERS TRAILERS

ROGERS TRAILERS are serving efficiently on the home-front too and new models which will be available when war contracts are completed, will be even more efficient than the multitude which have been so successfully operated by industry for many years.

ROGERS BROS. CORPORATION
ALBION,
PENNA.


LOOK TO YOUR SUCCESSFUL
POSTWAR FUTURE WITH
MARION
SHOVELS · CRANES · DRAGLINES · PULL-SHOVELS · CLAMSHELLS
Let us help you
with your plans
THE MARION STEAM
SHOVEL COMPANY
MARION, OHIO, U. S. A.
MARION
AFTER THE WAR IT WILL PAY TO
MODERNIZE WITH MARIONS

**GRUENDLER CRAFTSMANSHIP**

*Serving Industry over 50 Years*

***For Access Road and Air Base Construction***

# PORTABLE CRUSHERS

**Proper Size Aggregates - - on the job**

**Balanced, Non-Tipping. Expertly designed to meet your exact requirements in proper size aggregates—larger capacity and quick mobility to and from job.**

Four Wheel Maintenance JAW CRUSHER with Power Unit Serving America

**"Invest in America BUY WAR BONDS"**

**GRUENDLER ENGINEERS**

On the job to help you in any way, NOW and for your Post War Plans. Blue Prints or Practical Suggestions sent —No obligation.

***Mfgrs. of Double Roll Crushers and Hammer Crushers for Secondary Crushing Requirements.***

BULLETINS MAILED ON REQUEST

# GRUENDLER

## CRUSHER *and* PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.



*One Man* SPREADER

# For SEAL COATING and ICE CONTROL with fewer men at less cost

## *The* FLINK *Spreader*

**The Flink self-feeding spreader is strictly a one-man outfit. Operated by driver of cab, who can throw spreader into action as he rapidly approaches, crosses and leaves intersection. Then it can be thrown out of action. Flink spreads forward or backward, full width of street, or less than half width. Handles sand, cinders, etc., up to 1" in size, wet or dry, spreading evenly up to 35' width. Does not limit use of truck for other purposes as Flink spreader fits on end as a tail gate. Positive agitation, no bridging. Flink spreader will pay for itself many times over the first year in labor saved, in extra yardage covered and reduction of complaints.**

## *The* FLINK CO., STREATOR, ILLINOIS

*For particulars write our nearest representative:*

**WICO SALES**
2924 N. Western, Chicago 18, Illinois

**G. W. CLEMENTS**
3060 Fremont St., Columbus 4, Ohio

**C. R. HANSON**
2303 Grand Ave. Kansas City, Mo.

**TULSA MACHINERY CO.**
Tulsa, Okla.

**NORTHLAND DE LUXE EQUIPMENT CO.**
Janesville, Wis.

**H. C. JORDAN**
Irvington, Kentucky

**WISCONSIN OIL & EQUIPMENT CO.**
34 Park Ave., Oshkosh, Wis.

**4 ways you can help keep tank cars rolling . . . and speed your own asphalt deliveries, too!**

1. **Accurately estimate your asphalt needs** when placing yearly contracts.
2. **Carefully plan delivery schedules,** as far in advance as possible.
3. **Speed up unloading** by scheduling deliveries when your crews and equipment are available.
4. **Release empty cars.**

The Standard Oil Asphalt Representative in your locality will work with you in developing plans to meet this emergency. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Representative nearest your job.

*Gasoline Powers the Attack . . . Don't Waste a Drop!*

**STANDARD OIL COMPANY (INDIANA)** STANDARD SERVICE



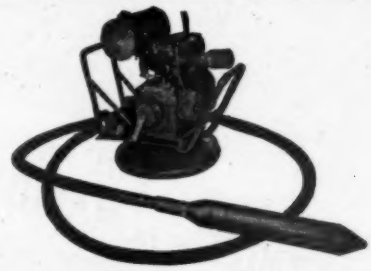
# LIFT with UNIT Mobile Crane

A single engine supplies both mobility and lifting power, with easy one-man operation. All main machinery fully enclosed in a one-piece cast gear case. Ask for complete data.

UNIVERSAL **UNIT** MACHINERY CORP., Milwaukee 14, Wis.

A 4393-1/3





Concrete

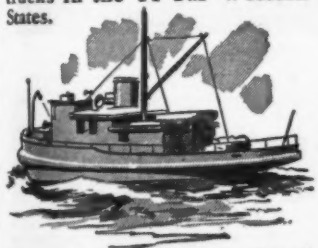
# VIBRATORS and GRINDERS

Write for Circular on types, sizes and Prices

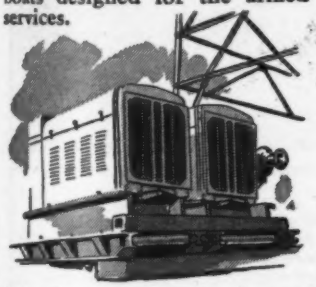
ELKHART **White Mfg. Co.** INDIANA

Cummins Diesel-powered trucks and shovels are a standard combination on major construction, material handling, metallic and non-metallic mining jobs. On the Mesabi Range, for instance, 30 to 40% of the total iron ore output is hauled by truck—the majority of them Cummins-powered.

Late in 1932, the world's first heavy-duty, diesel-powered freight truck went into service. The engine was a Cummins Diesel. Today, Cummins Diesels power approximately 90% of all franchise-operated, long-line, heavy-duty, diesel-powered trucks in the 11 Far Western States.



The world's first fully enclosed type marine diesel—now an accepted feature of marine engine design—was built by Cummins in 1928. Cummins Marine Diesels power fishing boats, work boats, pleasure craft and, today, many boats designed for the armed services.



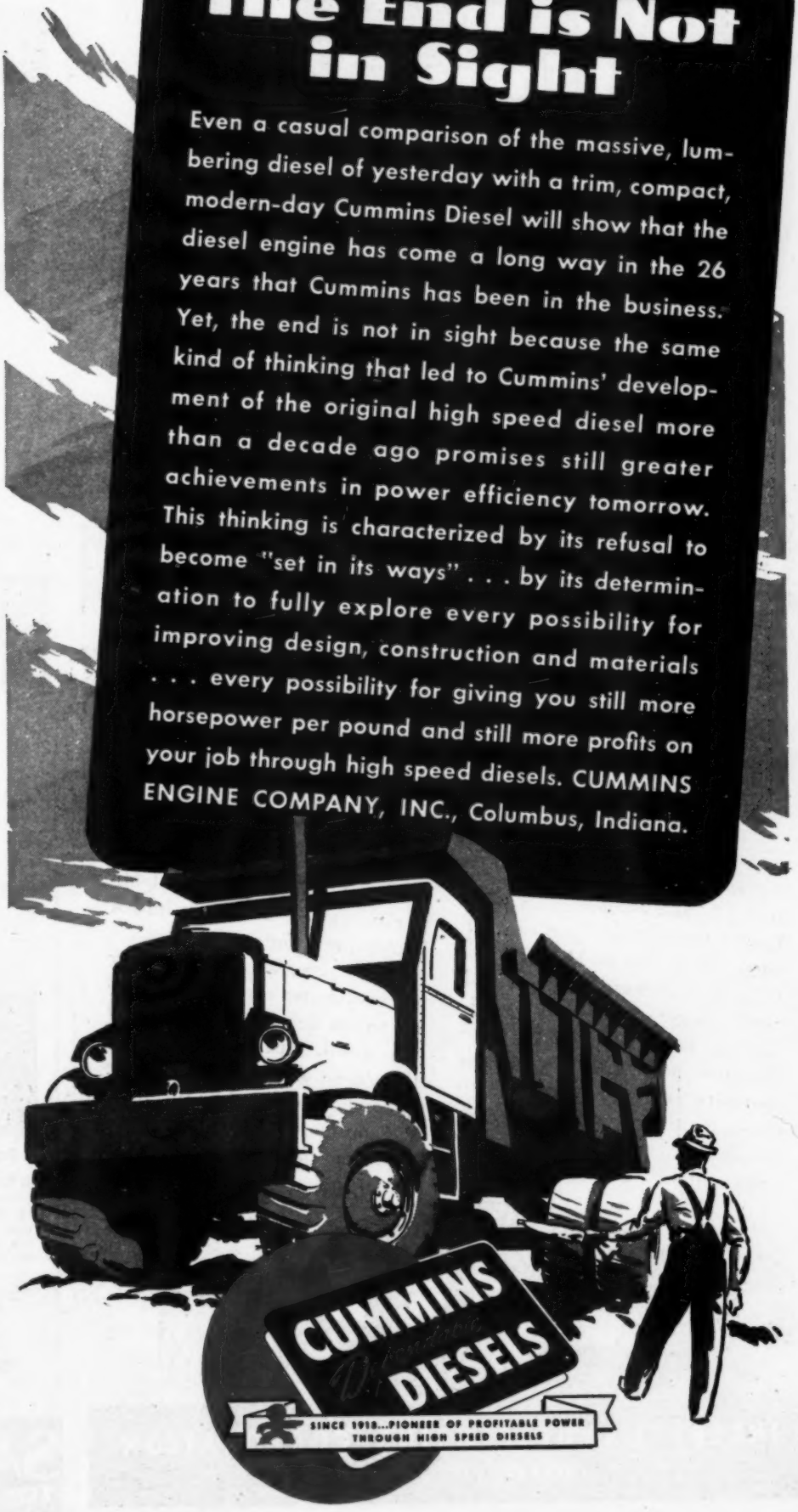
Four Cummins Diesels, three of them seven years old, powered the rig which this year drilled the world's deepest oil well. In this and many other heavy-duty services—logging, construction, and material handling—Cummins Diesels draw the *tough* jobs.

---

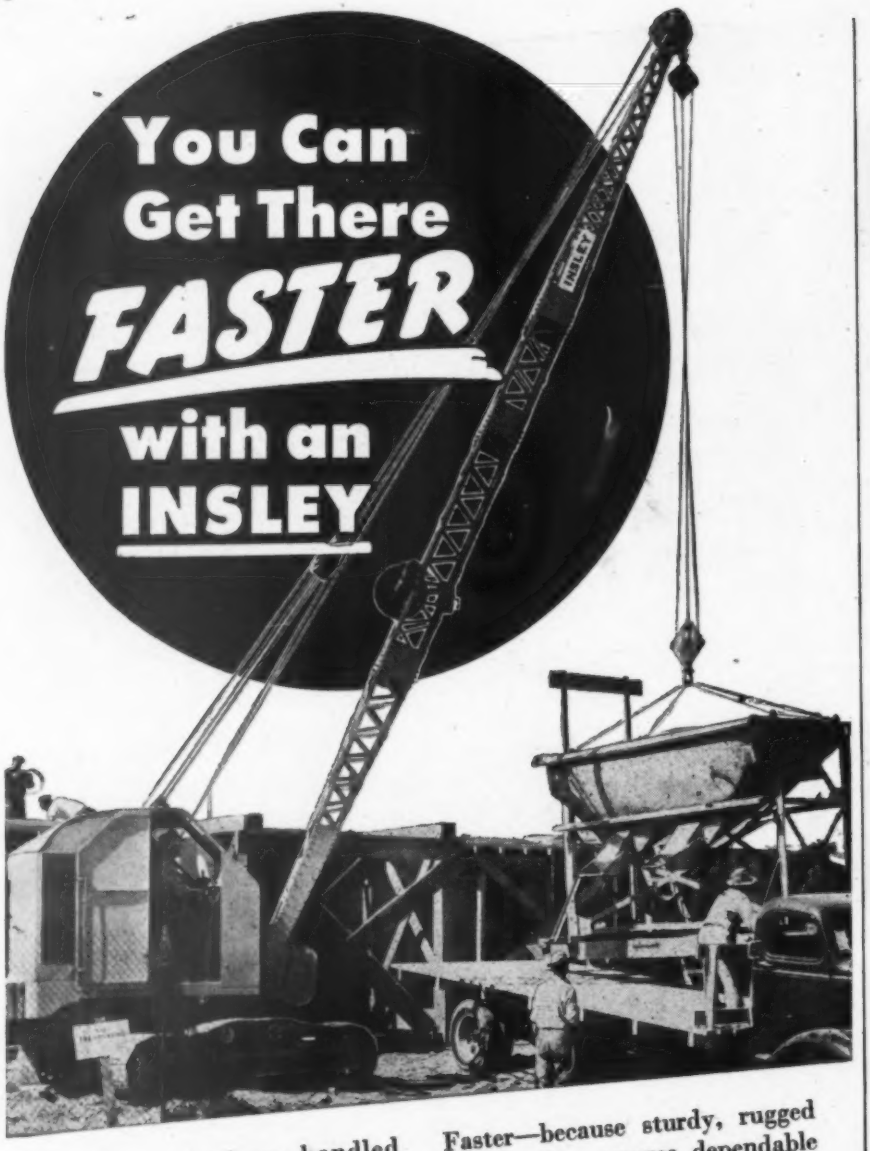
*Automotive models • marine engines for propulsion and auxiliary power • power units of all types • stationary engines • generating sets locomotive models*

# The End is Not in Sight

Even a casual comparison of the massive, lumbering diesel of yesterday with a trim, compact, modern-day Cummins Diesel will show that the diesel engine has come a long way in the 26 years that Cummins has been in the business. Yet, the end is not in sight because the same kind of thinking that led to Cummins' development of the original high speed diesel more than a decade ago promises still greater achievements in power efficiency tomorrow. This thinking is characterized by its refusal to become "set in its ways" . . . by its determination to fully explore every possibility for improving design, construction and materials . . . every possibility for giving you still more horsepower per pound and still more profits on your job through high speed diesels. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.



# You Can Get There FASTER with an INSLEY



Operators who have handled Insley 3/8 and 1/2-yard excavators have a saying that "you can get there faster with an Insley."

Faster—because Insley's rapid work cycle produces more yardage per hour, per day. Faster—because clean, compact design permits Insley Excavators to work the tight spots. Faster—because Insleys can be moved easily and quickly from job to job.

Faster—because sturdy, rugged construction assures dependable performance with minimum "down-time" for service.

Right now, all of the Insley Excavators we can build are going to our fighting forces all over the world. But after the war, there'll be plenty of new Insleys to handle your toughest dirt moving and material handling jobs—*faster and cheaper.*

EXCAVATORS • CRANES • BUCKETS • CARTS

INSLEY

CONCRETE PLACING EQUIPMENT

INSLEY MANUFACTURING CORPORATION

INDIANAPOLIS 1, INDIANA.

# Shunk

*Superior Quality*

BLADES AND CUTTING EDGES

For any make of machine
Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls. Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

30 years of manufacturing blades has developed for you a special steel, milled through our own rolls and forged at the edges to give that extra wearing quality you need.

All widths lengths, and thicknesses. Punched ready to fit your machine.

Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.

# Shunk

MANUFACTURING COMPANY

*Established 1854*

BUCYRUS, OHIO,

Member of A.E.D.

## MORE YARDAGE with LESS LABOR

Sauerman Cableway Digs Reservoir

EVERY SAVING in man-hours on construction work is a direct contribution to the war effort. Sauerman Scrapers and Cableways are chosen for excavating and stockpiling on defense projects because these simple, sturdy, long range machines have a 35-year record for saving labor and time in moving all kinds of earth materials.

*Write for Catalog*

SAUERMAN BROS., INC.

588 S. Clinton St. Chicago 7

SAUERMAN

LONG RANGE MACHINES

# HERE'S SOMETHING—MR. CONTRACTOR—YOU SHOULD KNOW

## THE MISSISSIPPI WAGON IS YOUR MONEY-MAKER ON LONG, FAST HAULS AS WELL AS SHORT, TURN-AROUND HAULS

Every contractor knows the "beating" his tractors take during long fast hauls with the ordinary semitrailer hauling unit. The constant pounding, surging and twisting of the loaded semitrailer mounted on the tractor is a continuous vicious attack upon it—always leading to the repair shop. Under such operations, long hauls become nightmares, and always lead to heavy expense due to repairs on transmissions, etc.

This is NOT THE CASE with the MISSISSIPPI WAGON, the world's most modern hauling unit. On long fast hauls the MISSISSIPPI WAGON is a "natural" money-maker because no part of the weight of the loaded trailer is carried on the tractor at these high speeds.

BUT ADEQUATE WEIGHT IS TRANSFERRED AT THE WILL OF THE OPERATOR TO SECURE MAXIMUM TRACTION IN LOW OR SECOND GEARS.

In figuring your bid a low figure can be set up as a reserve for repairs.

HERE IS WHY

**AT LIST PRICES EVERY GEAR, BEARING, AND SHAFT, IN THE FIVE-SPEED TRANSMISSION OF THE MISSISSIPPI WAGON TRACTOR-UNIT COSTS ONLY . . . $195.54**

**EVERY WEARING PART IN THE REAR AXLE & DIFFERENTIAL COSTS ONLY . . . $172.33**

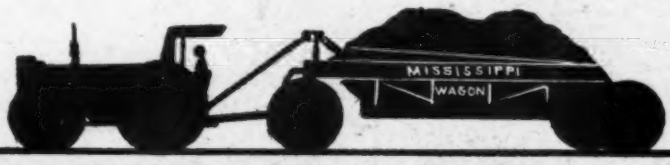
Prices on other repair items of the MISSISSIPPI WAGON are proportionately low in cost.

Post war competition will be tough, but not for the owner of the world's most modern hauling equipment—

**THE MISSISSIPPI WAGON**

★ ★ ★

Contact your nearest International Industrial Power Distributor for the complete facts about the MISSISSIPPI WAGON. He will tell you which of the three models are best suited for your particular needs.




**MRS MANUFACTURING CO.**
**JACKSON, MISSISSIPPI**

# Big Jobs move faster with O-P-E-N C-E-N-T-E-R traction

*Caterpillar Diesel DW-10 tractor with Goodyear Sure-Grip tires pulling LaPlant-Choate CW-10 scraper on Goodyear All-Weather Earth-Movers, moving heavy clay on airport job.*

THE trend in earth moving is to bigger yardages — faster speeds — longer hauls. That calls for tires that won't gum up and spin under peak loads — tires with a sharp, clean grip that keep pulling.

Look at the O-P-E-N C-E-N-T-E-R *self-cleaning* tread of the Goodyear Sure-Grip pictured here, and you'll see why it is the greatest traction tread ever built.

It has no dead-end tread pockets, no mud traps to pack up solid. Dirt and stones sluice out, keeping the massive lugs sharp and keen for deep biting.

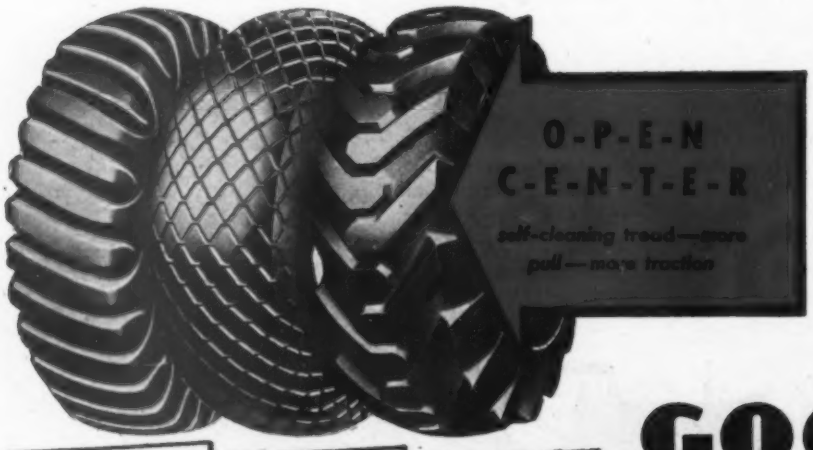
That's why you'll have less slip and spin with Goodyear Sure-Grips. They don't waste power; they keep you moving—on schedule.

This, combined with Goodyear's exclusive multiple-compounded construction and the extra strength of Goodyear's low stretch Supertwist cord carcass, gives you the sturdiest, toughest, most efficient tire ever built for big power units.

You can easily check on that. Just ask any contractor who has changed to Sure-Grips. He'll tell you Goodyears pull more, go faster and last longer. Why not see for yourself.

Sure-Grip, All-Weather Supertwist—T.M.'s The Goodyear Tire & Rubber Company

## THE RIGHT TIRE FOR EVERY JOB




HARD ROCK LUG for all rock work

ALL-WEATHER EARTH-MOVER for drawn vehicles

SURE-GRIP for mud and marsh

BUY WAR BONDS—BUY FOR KEEPS

GOODYEAR

THE GREATEST NAME IN RUBBER

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

ROADS AND STREETS

August, 1944, Vol. 87, No. 8

# Detroit Industrial Expressway

## Designs and construction problems on the Expressway's 5.8-mile, $11,000,000 Section 3, which is to be completed this year linking Willow Run Expressway System with City of Detroit

BIGGEST single road job under construction in the U. S. in 1943 and 1944 undoubtedly is Section 3 of the Detroit Industrial Expressway, where contractors holding 63 separate contracts have hurried to finish this link between the Willow Run bomber plant near Ipsilanti and the Detroit area.

Joining with the Expressway's Section 2 and the Willow Run Expressway System (completed 1942-3), Section 3 will become part of a 16-mile, $28,000,000 limited-access highway system of the most advanced design. The combined systems represent Michigan's first use of limited access and are favorably located to become parts of proposed interstate highways. Meanwhile the completed portion is shuttling workers, war materials and sub-assemblies between Willow Run, Ford's River Rouge plant and Detroit.

As with the earlier sections to the west, Section 3 is designed as a 4-lane divided highway with provision for additional inner lanes. Section 1 in city of Detroit is postponed until after the war.

Beginning at the west end of Section 3, at Southfield Road, 40 contracts for about $9,000,000 were awarded in 1943 covering grading, drainage, paving and bridges. The expressway lanes were opened to traffic as far as Greenfield Road (See Map) by the year's end. Paving during the first half of 1944 progressed slowly, waiting on completion of the numerous bridges.

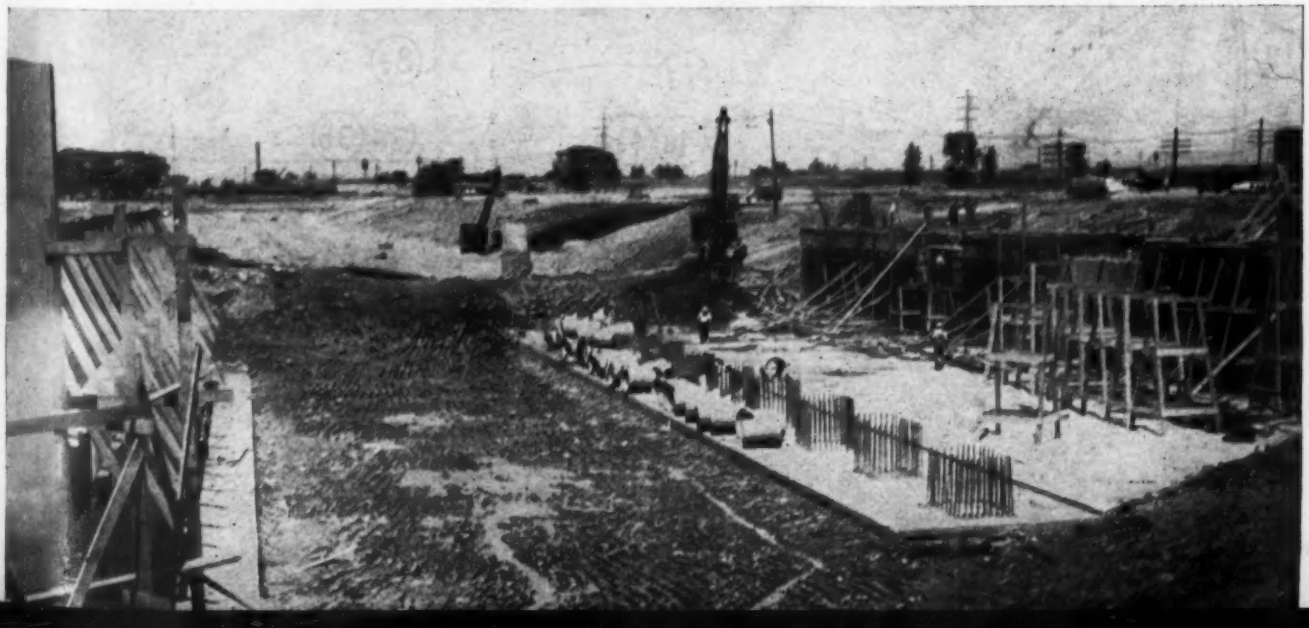
### Partly "Raised," Partly Depressed

For the first three miles Section 3's pavement level is 4 to 8 ft. above the flat, high-water-table area traversed, the two roadways being carried on fills of locally available sand. Intersecting roads are depressed. East and west roadways are spaced 125 ft. minimum, c. to c. inner lanes. Minimum r/w width is 314 ft.

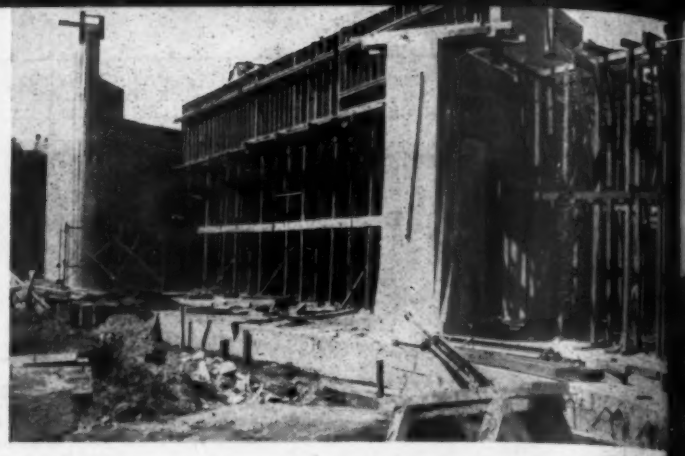
The easterly 1.8 miles changes to depressed design with the roadways 16 to 20 ft. below general ground level. Depression was necessary because suitable borrow material for an embankment was not available, and because of the low bearing value of the supporting soil. Width of cut is about 200 ft. between bank tops; roadways, 64 ft. apart c. to c.

The cross-section design throughout is marked by the flatness of slopes. Fill slopes are 6 to 1 and cut slopes in depressed section 3 to 1.

The depressed expressway is shown partly graded into the distance; in foreground, 8-track Mich. Cent. R.R. bridge (W. J. Meager Const. Co.). Dragline teeth marks denote blue clay, tough to excavate, but unstable when wet and tending to heave under lateral pressure from weight of abutment backfill. Foreground to be paved with heavily reinforced 21-in. concrete mat, keyed and doweled to pier footings. Concrete supplied by 27-E paver chuting to Pumpcrete hopper with 800-ft. max. line



Schaefer Road bridge over depressed expressway. Deck forms on pile bents, as shown here, settled into clay under weight of T-beam pour. To prevent similar trouble on other structures, form struts were supported on concrete mat. L. A. Davidson, contractor



Miller Road bridge over depressed section. Building-type form struts (composite wood and cast-iron tubular) supported on concrete mat. Darin & Armstrong, Inc., old-time building contractors, tackled this structure with 30 carpenters

## Getting a Bit Complicated

How the Expressway Section 3 job was broken down into more than 60 state contracts under 23 Federal project divisions as of June 15 (simplified keys used).

1—*Southfield Road.* (1a) N & S structures, Bryant & Detwiler; (1b) ditto, slope paving, Robt. W. Meyer; (1c) interchange structure, Darin & Armstrong, Inc.; (1d) ditto, slope paving, R. W. Meyer; (1e) Van Born structure, Darin & Armstrong; (1f) ditto, slope paving, R. W. Meyer; (1g) pumphouse, Darin & Armstrong.

2—*Ecorse Creek* culverts, Carl E. Goodwin & Sons.

3—*Oakwood Blvd.* (3a) Structure and pumphouse, Peninsular Const. Co.; (3b) slope paving, R. W. Meyer.

4—*Outer Drive.* (4a) Structure and pumphouse, W. J. Storen Co.; (4b) slope paving, R. W. Meyer.

5—*River Rouge bridge,* W. J. Meagher & Sons.

6a—*Southfield to Ecorse Cr.,* concrete paving, Taylor Bros. Co., Inc. (Chas. J. Rogers, subcontractor, grading and draining).

6b—*Southfield approach,* Taylor-Rogers.

7 (a & b)—*Ecorse Cr. to Oakwood* and on Outer Drive, concrete paving, Oak Const. Co.

8 (a & b)—*Oakwood to River Rouge* and on Oakwood, concrete paving Bridgeport Core Sand Co. and Louis Garavaglia & Son Co.

9—*Greenfield Road.* (9a) Structure, L. A. Davidson; (9b) pumphouse, Wayne Co. Rd. Comm.; (9c) slope paving, R. W. Meyer.

10a—*River Rouge to Gate* 10 (G. & D. S.), Chas. J. Rogers, Inc.

10b—*Greenfield Rd.* (G. D. & S), Chas. J. Rogers, Inc.

11—*Rotunda Drive.* (11a) Piling and sewer, Thos. E. Currie Co.; (11b) structure, D. T. Frank.

12 (a & b)—*N. Y. C. R. R. underpass,* fabri., Bethlehem Steel Co.; structure, W. J. Meager & Sons.

13 (a & b)—*Ry. Yard branch underpass,* fabri., R. C. Mahon Co.; structure, Darin & Armstrong.

14 (a, b, c)—*Schaefer Road,* G. & D. S., Wilmer Pierson; *outlet sewer,* A. Arcari; *Gate* 10 *road* to Ford Admin. bldg., G. & D. S., W. Pierson.

15 (a & b)—*Ford Admin. Bldg. to Miller Road,* and Rotunda Drive G. & D. S., W. Pierson.

16—*Pere Marquette R. R. to Wyoming Ave.,* grading, Louis Garavaglia & Son Co.

17—*D. T. & I. R. R. underpass.* (17a) Gate 10, fabrication, Amer. Bridge Co.; (17b) underpass str., W. J. Storen & Co.; (17c) trackwork, etc., D. T. & I. R. R.; (17d) power line, tel. cable, Ford Motor Co.

18—*P. M. R. R. underpass.* (18a) Fabrication, Amer. Bridge Co.; (18b) structure, L. A. Davidson; (18c) track and signal, P. M. R. R.; (18d) tel. cable, Ford Motor Co.

19—*Schafer Rd.,* structure, L. A. Davidson.

20—*D. T. R. underpass.* (20a) Fabrication, Worden-Allen Co.; (20b) structure, Darin & Armstrong; (20 c & d) D. T. R. blast furnace lead, fabr., Aber. Bridge Co.; structure, Darin & Armstrong; (20 e, f, g) track and power line; D. T. R. R., Ford Detroit Edison.

21—(Data not obtained).

22—*Gate* 10 interchange, gr. rep. structure, Fry & Kain.

23a—*Miller Rd.* intersec., grade temporary road, J. Porath & Sons Co.

23b—*Miller Rd.* structure, Darin & Armstrong.

24 (a & b)—*Rouge River to Gate* 10, concrete pav., sidewalk and curbs, widen, Taylor Bros.

25—*Steam tunnel* to Ford, Couse & Westpal.

26—*Butler Rd. pumphouse,* E. C. Nolan & Son.

27—*Irving Ave. pumphouse,* E. C. Nolan & Son.

28—*Paving, Gate* 10 *inter.* to Ford admin. bldg., Oak Const. Co.

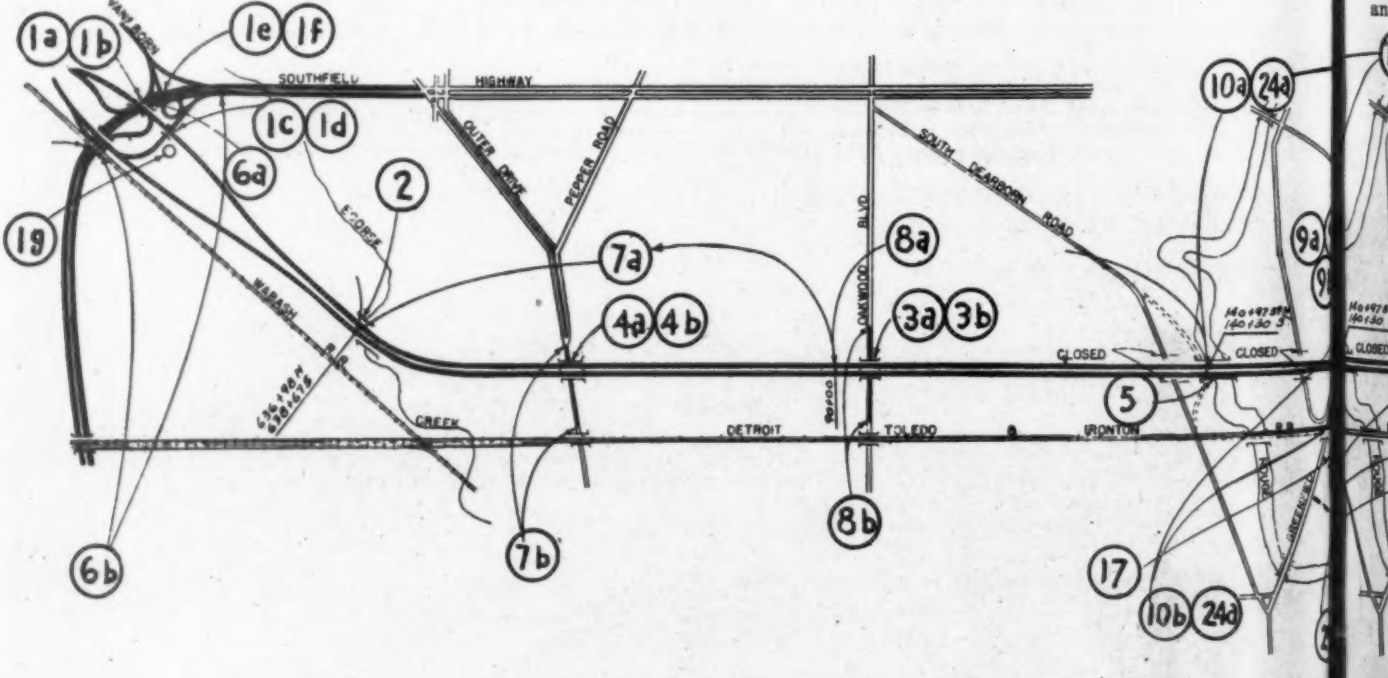
29—*Grading, Gate* 10 *rd.,* L. Garavaglia.

30—*Paving, Ford admin. to Miller Rd.,* Thos. E. Currie Co.

31—*P. M. R. R. to Wyoming,* grad. d. & surf., L. Garavaglia.

32—*Mich. Ave. bridge* over W. expressway, L. A. Davidson.

33—*Mich. Ave. pumphouse,* F. C. Atletwed.



Rouge River bridge, largest structure on Section 3, was completed early in 1944 by W. J. Meager & Sons at about $500,000 cost. Continuous concrete T-beam construction on 95-ft. wood piles

Express lanes are designed for unlimited speeds, with no grade exceeding 1% and curves not a problem on Section 3. Interchange ramp pavements are designed for 25 mph. Ramp grades are held to 3% (one 4% exception) and ramp radii to 200 ft. minimum with most turns easier.

## Ford Interests Donate Right-of-Way

As a notable act of generosity and indirectly as compensation for the asset of a modern expressway interconnecting various Ford enterprises, the Ford interests deeded about four miles of right-of-way to the State of Michigan. This act cut project cost $4,000,000.

Spoil areas through Dearborn are graded to remove any unsightliness and will eventually be grassed over.

## 7,600,000 Cu. Yd.-Mi. Overhaul

The 3,835,000 cu. yd. of excavation awarded to June 15 involve 7,600,000 cu. yd.-mi. of overhaul. Overhaul averaged, about two miles, due to necessity of bringing sand 10 miles for pavement sub-base along the depressed-section, and because clay from the depressed section had to be spoiled several miles west along the non-depressed roadway.

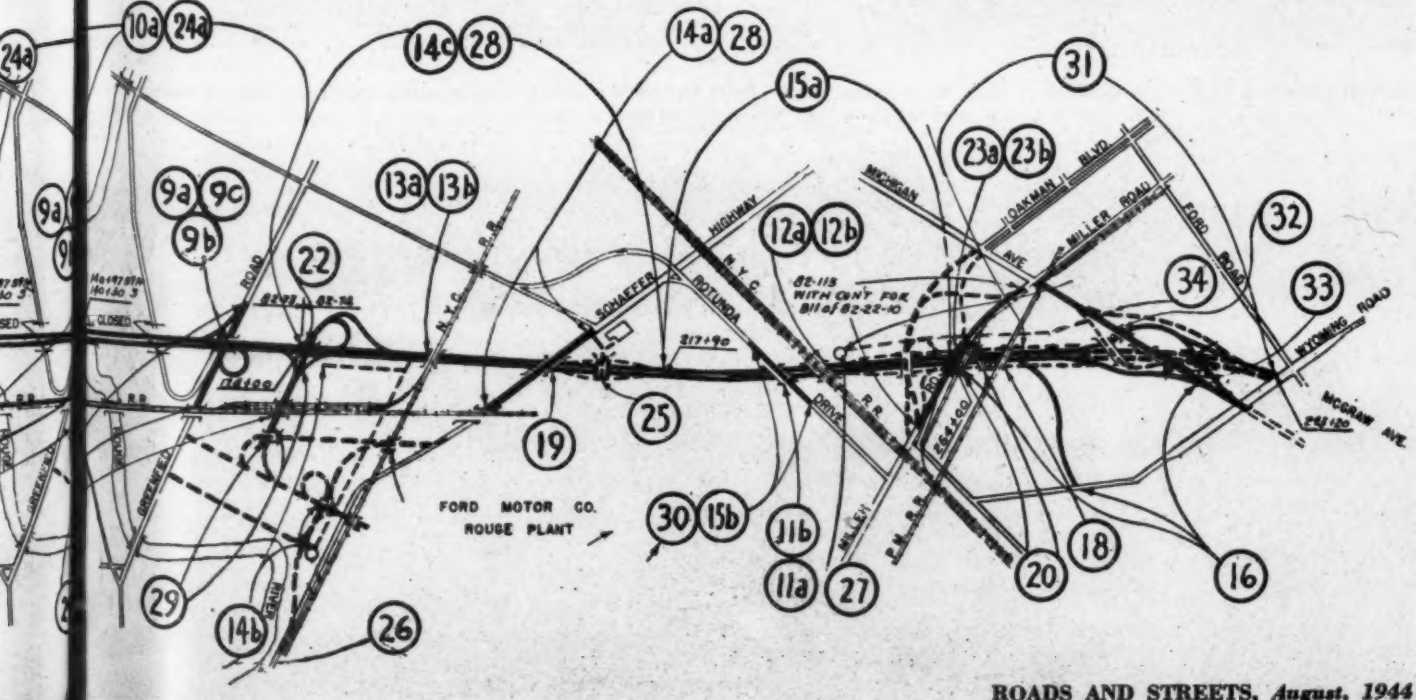
Surface sand and soil are underlaid by about 70 ft. of soft blue clay, 20 ft. of hard clay, then rock. Bridge piling were designed to penetrate the hard clay.

Top soil was stripped with tractor-drawn scrapers on short haul and draglines kept a big fleet of trucks busy on long hauls. Most underpass excavation was taken out with shovels and draglines, followed by clams for footing excavation and dragshovels for drain trenches. However, a considerable yardage of difficult blue clay was accounted for by scrapers.

## Drainage a Big Item

As an aid to thorough drainage, a 24-in. sand base was specified for all pavement on the project (standard on Mich. state work).

The fill for the raised section consists of a sand core under the pavement, placed and rolled in 12-in. layers and compacted with pnuematic rollers and rubber tired vehicles; and selected material in shoulders, with 2-ft. wide sand-filled trenches or bleeders extending 50 ft. away from the pavement at 500-ft. intervals or



(Above) 3-yd. dragline on Garavaglia's depressed-section grading contract is spoiling heavy blue clay not suitable for filling, later to be hauled away

(Left): Setting a 50-ton, 63½-foot double-box girder section on one of Davis & Armstrong's railroad bridges. Two 35-ton cranes picked steel from below

(Left, below): A nice piece of dragline work. After trimming thus, slopes are sodded as quickly as possible to avoid erosion. Underpass pumping station of modernistic design in foreground

(Below): Dumping porous backfill in drainage trench located along top of cut banks through Outer Drive underpass. (Oak Const. Co.) Bank later to be sodded. Note variable-width median strip at right

(Below): Underpass roadway to Gate 10 of Ford's River Rouge plant, one of first parts of Sec. 3 to be paved in 1944. Air entraining concrete on sand subgrade used here and throughout project

oftener at low points or clay areas.

Sub-base drainage in all cases was provided by placing a row of 6-in. vitreous tile (open joint) under slab centerline or edges.

## Road Builders Get Tunnel Experience

Drainage has been a major problem along the depressed highway. The 1.8 miles will require construction of three independent storm sewer systems, each roughly paralleling the right-of-way and collecting storm water from a section of the expressway and its structures. Two will lift into existing storm lines of the city and one into the River Rouge, by means of automatic pumping stations installed entirely underground. In addition, bank-side pumping stations will be installed at four grade separations.

One sewer system, at Schaefer Road near the Ford administration building, comprises 2,750 ft. of 48, 66 and 72-in. plain concrete circular sewer built in tunnel. Arcari Construction Co. is building the line through five circular shafts formed of the same lagging and 2 x 6 hardwood sheathing used below. Clay is mined with hand knives and hoisted to dump trucks in mud boxes. Several hundred feet of Arcari's work required 8 lb. of air.

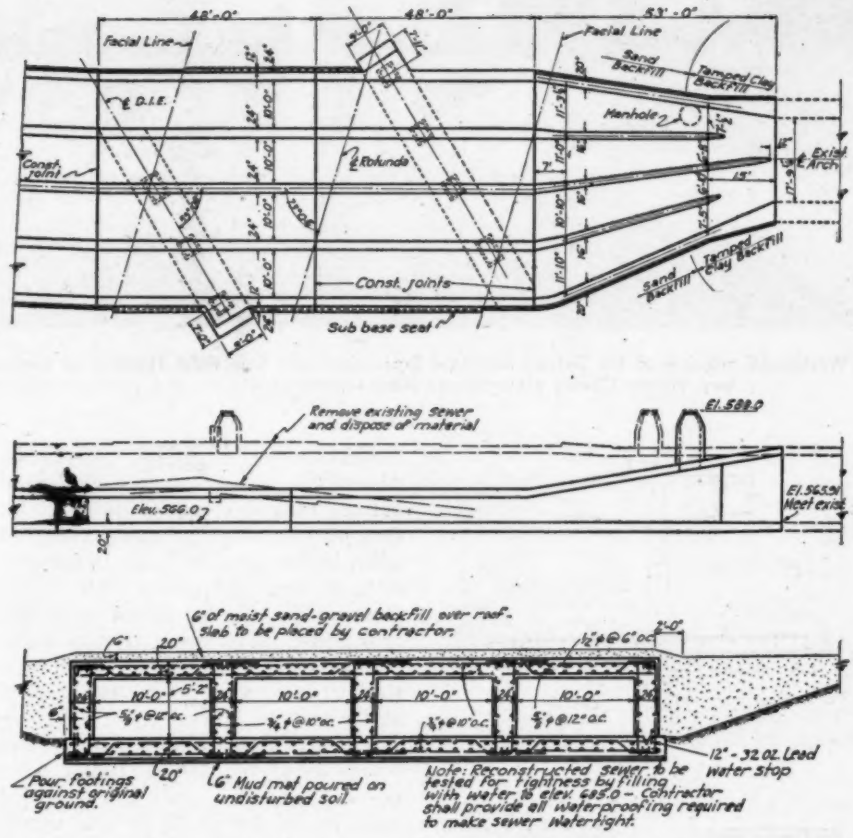
Another sewer contract, let to Vella & Mancini this June, will total 0.7 miles of 84-in. line, partly in tunnel. Tunnel concrete is being delivered by transit-mix trucks, deposited down the shaft through an elephant truck, and placed behind the forms by hand. All tunnel work was severely handicapped by a shortage of experienced tunnel workers. Pipe for the open trench part of Vella & Mancini's job is being made on the job by a commercial pipe manufacturer.

Ground water along the depressed section is intercepted by porous-backfilled drains placed along the top of the embankment slope, and augmented under special conditions by a second line part way down the slope. The latter line has proved difficult to trench with power equipment.

Inlets and manhole gratings throughout the project are of steel-saving reinforced concrete design.

## Air Entraining Concrete

Concrete pavement totaling about 400,000 sq. yd. has been let in 20 separate contracts involving surface. About half the main expressway was completed late in 1943 under three grade-drain-structure contracts extending to River Rouge. Remaining expressway paving is to be done by Taylor Bros., Oak Construction Co. of Royal Oak, and Louis Garavaglia


48'-0"
48'-0"
53'-0"
Facial Line
Facial Line
Sand Backfill
Tempered Clay Backfill
Manhole
Rotunda
Const. joints
Sub base seat
Remove existing sewer and dispose of material
El. 588.9
Elev. 566.07
El. 563.51 Meet exist.
6" of moist sand-gravel backfill over roof-slab to be placed by contractor.
10'-0"
5'-2"
Pour footings against original ground.
6" Mud mat poured on undisturbed soil
12" - 32 oz. Lead water stop
Note: Reconstructed sewer to be tested for tightness by filling with water to elev. 585.0 – Contractor shall provide all waterproofing required to make sewer watertight.

**An existing 9x12 ft. arch sewer was rebuilt to this multiple-box design to carry it under the footings of Rotunda Drive underpass bridge. Bridge pier columns are spaced to lie over walls of box**

& Son of Detroit, each of whom also have certain cross streets, ramps and connections.

All concrete pavement is 9-in. uniform, without steel. Expansion joints with ¾-in. premolded filler are spaced 60 ft.; dummy joints, 15 ft. Longitudinal center joints are keyed and not doweled.

Air entraining concrete, standard today on Michigan state highway work, is specified for all pavement, curbs and walks. Curing is by liquid membrane.

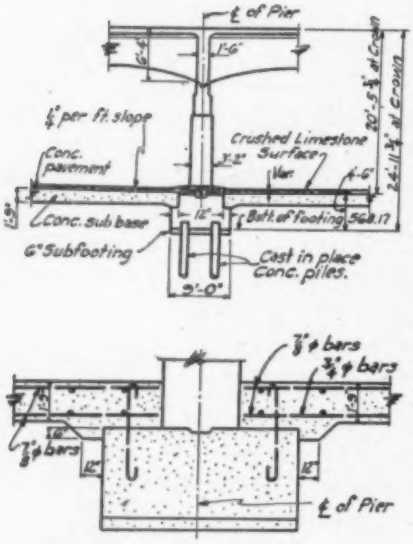
## 25 Bridges in Section 3

Section 3 includes 4 river crossings, 15 highway separations and 6 railroad grade separation bridges. Representing $7,275,000, or 65% of the total project, structural contracts involve 77,500 cu. yd. of concrete, 800,000 cu. yd. of excavation, 4,500 tons of structural steel, 3,800 tons of reinforcing steel, 600,000 lin. ft. of piling and 10 miles of railroad track work. The Michigan highway department men, hense, have had a thorough hazing on railroad as well as sewer work on this job.

Highway bridges are reinforced concrete T-beam structures, 12 continuous and 5 cantilever. All are notable for their exceptionally pleasing

**Typical view along raised roadway, Section 3 east of Southfield Road through Dearborn. Each express 2-lane is built on separate sand fill embankment; drainage is carried along center of dividing strip**

Westbound crossing of the Detroit Industrial Expressway over Southfield Highway at beginning of Sec. 3, as seen from the eastbound roadway. Wayne County plans to add inner express pavements as a post-war project. Bryant & Detwiler Co., contractor




Concrete sub-base slabs were placed under depressed roadway structures to prevent plastic uplift of clay. Typical detailing at pier footings

architectural treatment. Abutments are cellular, with stepped wing footings. The five railroad bridges are of typical steel plate girder design.

## Foundations the Big Problem

Foundation difficulties overshadowed all other bridge problems. Five structures toward the west utilized spread footings, the others required piles 80 to 106 ft. long. Creosoted wood piles were specified under abutments where heads extended above ground water, untreated piles elsewhere. Pile clusters included piles on batters ranging up to 4-in. in 12-in. One of the tense moments occurred when batter piles on L. A. Davidson's 4-track Pere Marquette R.R. overcrossing had to be driven with the heads just 10 ft. away from a high-voltage transmission line. Piles here were 96 ft. long, of solid, tubular steel shells without taper.

Darin & Armstrong's N.Y.C. yard bridge employed 100-ft. (ave.) composite piles formed with spiral welded steel in the lower 25 ft. and corrugated steel above. Piles were filled from transit-mix trucks.

On the Schaefer Road bridge, 90-ft. creosoted piles were driven in prebored holes on a 3 to 1 batter by L. A. Davidson, contractor, who dispensed with the customary hammer leads and did the job with two crawler cranes. The pile hammer was first fastened to the head of the pile and held in position by an extension on the driving head. The pile was picked up by the two cranes, and one rig held it in batter position while the other held the hammer in position during driving by means of a cable sling.

## Plastic-Flow Clay

The deep layer of soft blue clay encountered in the depressed section showed serious tendency to flow laterally due to bank pressure or weight of abutment backfill. Three important steps were taken to prevent or minimize this.

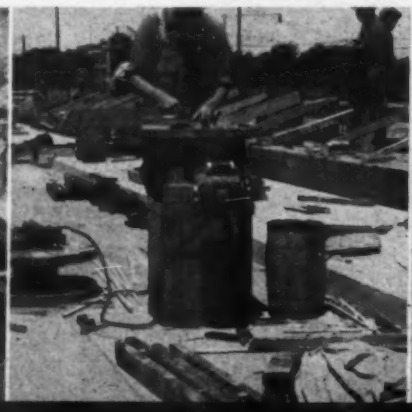
First, specifications required that excavation for footings below the depressed cross-section was not to begin until all fitting piles were driven. Then only one footing at a time could be excavated around the piles, after which piles were quickly cut off at footing level and capped with concrete before the next footing was opened.

In this connection it was found that any footing excavation opened deeper than 20 ft. for longer than 24 hours resulted in lateral flow which would cause serious trouble; 20 ft. seemed to be a critical depth.

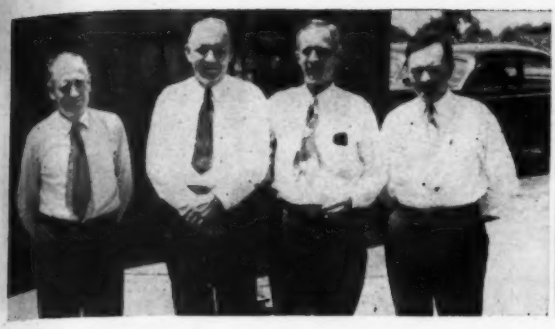
Second, specifications limited the weight of backfill behind abutments to 75 lb. per sq. ft. This weight was obtained by using a combination of cinders and slag selected for its light weight, the latter being thrown against the backwall to protect concrete against possible spontaneous combustion in the cinders.

Third, immediately after completion of pier footings at each bridge, the depressed cross-section under the bridge was paved with a 21 to 24-in. concrete mat. Mats were doweled and keyed to adjacent footings, and reinforced top and bottom to withstand flexural stresses that might be set up by uplift pressure of 300 lb. per sq. ft. The concrete mat acts as a sub-base for the expressway pavement. It also serves the triple purpose of prevent-

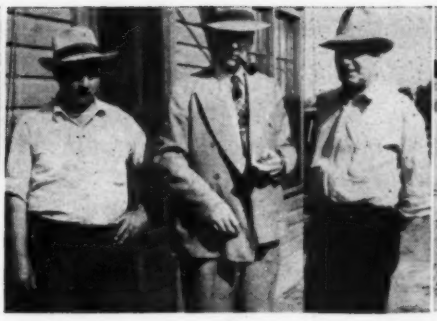
Schaefer Road bridge (L. A. Davidson), showing form details for modernistic concrete hard rail. Power table saw speeded this work. Heavy timber used as a support for form bracing



Showing pleasing architectural details of railing and entire underpass



Some of the engineers and builders on the D. I. Highway (left to right): E. H. Haar, asst. bridge engr.; Jim H. Flynn, asst. bridge engr.; H. J. Conroy and Paul Ueberhorst, field supervising bridge project engrs.



Charley Sauer, supt., Don Wells, gen. supt., and Pat Rogers of Charles J. Rogers, Inc., excavating contractors

Mark Storen, of W. J. Storen Const. Co., with H. R. Boyd, Storen supt., and C. A. DeLong

ing piers from moving laterally in event the bank clay starts to displace, holding the roadway down against possible heaving, and supporting forms during deck construction. The importance of the latter function is illustrated by the fact that at one overpass a combination of timber crush and falsework pile settlement resulted in 2½ in. of settlement in deck forms after T-beams were cast.

### Deck Settled During Pour

On the Schaefer Road overpass, to compensate for such settlement on pile supported falsework, the subbase deck slab was poured to the necessary extra thickness after the heavy T-beam concrete had been placed and levels taken to measure settlement. By running levels quickly the concreting operation was interrupted less than 30 minutes and deck construction thus kept homogenous.

The bridge contractors employed a variety of mat-supported deck forms. Darin & Armstrong, with long experience in building construction, used tubular cast-iron struts familiarly seen on such work.

Most bridge contractors had bulk cement elevators and batch plants adjacent to the work. W. J. Meagher & Sons on the NYC underpass placed concrete with a Pumpcrete line up to 500 ft. long, feeding it directly from a 27-E paver set up as a stationary mixer. On this 8-track railroad-over-depressed-highway bridge, incidentally, the contractor delayed the wingwalls on one side in order to make room for a parallel falsework trestle from which girders were set. Girders weighing up to 67 tons were brought in by rail, set off on this trestle and moved laterally to position on dollies supported on a lateral second system of falsework.

H. C. Coons, chief engr. and deputy comm'r, Michigan state highway dept.; C. H. Brown, acting metropolitan engr. (in charge); G. N. Cargill, supt., Oak Const. Co.; Art Kirchoff, proj. engr., and Louis Garavaglia, contractor

Construction of the Outer Drive underpass, completed in 1943, required detouring a large volume of traffic and moving a heavy underground Ford power line to new location.

One of the most interesting design and construction problems encountered on Section 3 occurred in building the Rotunda Drive bridge over the depressed expressway. An 18-ft. trunk sewer, which passes under the site, had to be torn out and rebuilt as a flat, 4-celled concrete box with openings 5½ ft. high by 10 ft. wide. (See sketch.) Piers are superimposed on this box.

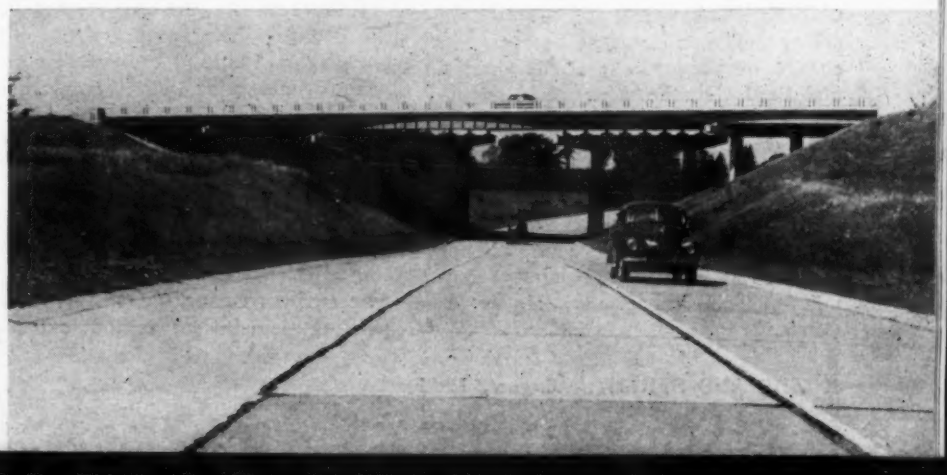
### Notes on Interchanges

The expressway is notable for the use of directional-type interchanges into which the driver turns in the direction of the cross-road he wants to take. Traffic enters and leaves main express lanes along dark-concrete merging areas which converge in 1,000 to 1,200 feet.

Most elaborate interchange on Section 3 is Southfield Road at the west end. As shown in sketch there are four grade separation structures, two being on the expressway proper and two giving access to the expressway on Southfield. Completed in 1943 except for trimmings, its structures provide for future additional 2-lane inner express roadways on Southfield Road.

### Temporary Roadways Designed for Heavy Service

Several detour roads have been required on the east end of Section 3. A 2-lane, 24-ft. pavement is built for each direction. The pavement consists of a 2-in. hot-mix bituminous



Three-level bridge—one of two similar structures built in 1941 and 1942 on the Willow Run Expressway near the Willow Run plant entrance

Asphalt block on a hot mopping of asphalt, specified on all railroad bridge decks

Weighing test cylinders to check unit weight of concrete on the Gate 10 paving job

An interesting experiment on the Detroit Industrial Expressway is the use of extra-large scale signs and markers

concrete mat on a thoroughly rolled, choked slag base. The importance of substantial detour construction is shown by the fact that Michigan Avenue under which the westbound express lane passes near the city end of Section 3, carries up to 25,000 vehicles daily.

The entire Detroit Industrial Expressway is 75% federally, 25% state financed, and was designed and supervised by the Michigan state highway department in cooperation with the Chicago PRA office. C. H. Brown, acting metropolitan engineer, is in charge of road work; H. J. Conroy and Paul Ueberhorst are field supervising bridge project engineers. Scott A. Baker, acting constructing engineer, and J. H. Flynn, assistant bridge engineer, are actively in charge of details out of Lansing, under state highway commissioner Charles M. Ziegler and deputy commissioner-chief engineer, Harry C. Coons.

## Pan American Highway Congress—Oct. 12

The fifth Pan American Highway Congress, originally scheduled to be held at Lima, Peru, July 15 to 25, has been postponed until October 12.

Plans for the Congress are well under way. The organization committee has sent invitations throughout the Americas to persons connected with leading public and private organizations in the road building field, manufacturers and others interested in motor transportation. They will attend as observers.

Official delegates soon will be designated by the governments of the American republics. The agenda has already been issued by the organization committee of the Congress.

## "No Dumping" Seen in War Surplus Bills Now Before Congress

With more than two-score bills introduced on war surpluses, Congress is concentrating attention on several measures, each of which is in general agreement and indicates orderly, businesslike disposal of surplus equipment and materials according to an ARBA bulletin.

Typical of the recent bills is the Murray-Taft-Stewart Bill referred to the Senate Military Affairs Committee August 10. It places emphasis on private enterprise, with strong provisions for protection of small business and utilization of normal trade channels. The bill aims to "discourage disposals to speculators."

Charles M. Upham, ARBA engineer-director and secretary to the construction equipment industry's war surplus committee, testified that pending legislation is of extreme importance to the highway construction equipment industry, for it has been producing construction equipment for the Army and Navy and other war uses at two to ten times the volume of peacetime production.

The equipment being used by the Army and Navy is the same as is required on highway and other construction projects. Any dumping of war surpluses would disrupt the national economy and cause widespread unemployment, he said.

The Murray-Taft-Stewart bill contemplates the overall question involved in the distribution of surplus property. It would legalize a Surplus War Property Administration in the Office of War Mobilization. There would be an Administrator, and a Surplus Property Board, such as the policy board now functioning under executive order, with the exception that two representatives each of industry, labor and agriculture, appointed by the Administrator, will be included.

The various disposal agencies would organize their own advisory committees composed of representatives of small as well as large business, including distributors, and labor, farm and consumer groups.

The bill limits to the war period the absolute right of owning agencies to declare which property under their control is surplus. At the end of hostilities, the Administrator can require necessary information and declare property surplus on his own determination. Even so, the owning agency has recourse of appeal to the President if in the judgment of the agency the property in dispute is essential to its needs.

The Colmer Bill, embodying similar provisions, is expected to be considered soon by the House.

# Editorial

## HOT WEATHER POST-WAR THOUGHTS

OFFICIALS feel badly "hung up" right now in their planning. Rightly they aren't disposed to be too definite on post-war highway and street programs until they know how much federal money can be counted on and on what matching basis, and how it will be earmarked.

That fact is no excuse for failing to keep up "steam" among the few men left in the design room. Some highway departments continue to make better progress than others in laying by completely designed projects, right-of-way bought and ready for bids. Shortage of engineers isn't the whole problem. As one state highway chief observed the other day, designers lack the incentive of meeting a normal succession of letting dates. When a flock of blueprints have to be ready for handing out to contractors on such and such a date, as in normal times, field parties and design squads somehow make the deadline. Getting plans ready for a vague post-war date is about 30% slower, human nature being what it is.

So, why not post a series of imaginary "letting" dates on the bulletin board between now and Christmas for these p-w projects? It's an idea.

Waiting on Washington isn't the whole fiscal answer either. Before highway construction can be fully resumed on a scale to meet the nation's post-war needs, reminds Mr. MacDonald of PRA, all sources of revenue must be gauged. Much depends on gasoline tax collections and license fees, which are certain to rise rapidly as soon as new cars and trucks get out on the road.

But there's an old thorn: diversion. In 1942, $204,165,000, or 16% of $1,275,335,000, net state imposts on highway users went for non-highway purposes.

Legislatures in nearly every state will convene this winter. They will have the opportunity of considering highway legislation necessary for adequate post-war programs. Congressional feeling at the moment seems to be that the states must contribute on the old 50-50 rather than the proposed 25% state, 75% federal matching basis. The campaign to get state road revenues restored to the roads should be tackled with renewed vigor.

▼

## SELLING WITH ARTISTS' DRAWINGS

RIGHT now the big worry in post-war plans preparation is where to get designers. But eventually another problem will loom in connection with many projects, namely, how to put the improvements over with the public, or at least with committees and citizen groups. Visualization and salesmanship will be especially necessary in the case of bold and elaborate schemes for traffic relief needed in larger cities.

An increasing number of planning agencies are using perspective drawings to help the man on the street—motorist and voter—visualize such projects. More agencies could profitably use artists' "delineations"—to use a $64 word now bandied about in the office of one highway department. Architectural draftsmen trained in the preparation of such drawings are often available today. The cost of such drawings is legitimate project expense and a minor one in relation to the important and costly tasks they can help to sell.

---

## Rolled Up and Ready—

On the table pictured are completed construction plans for an estimated $6,200,000 worth of new Connecticut state highway work which could be advertised immediately, including ordinary trunk line improvements, parkways, structures, drainage, etc. According to D. H. B. Starr, engineer of location and design (seen here), the department, in spite of its short design staff, has $8,000,000 in work that could be let with a few weeks' notice, most of which is cleared and ready now except for some right of way details. Another $19,000,000 is on the boards, and $5,000,000 in needed projects hasn't been begun—$32,000,000 post-war highway work in all for this state of advance engineering.

Among the more important projects to be pushed is the completion of the remaining 9 miles of the Wilbur Cross Parkway, entailing $1,750,000 in bridges, $1,500,000 in grading and $500,000 in paving; the Hartford approach to East Hartford bridge; and considerable trunkline reconstruction.

1. A grader with scarifier rips into and partly removes shoulder material

2. Trenching machine leaves subgrade practically ready to roll

3. Standard trench roller then compacts the subgrade thoroughly

# 6500 Ft. Daily with Special Widening Equipment

## Labor-saving ideas help make fast time on McCourt Construction Co.'s hot-mix widening-resurfacing contract in Ohio

By W. H. MOORE
Division Engineer, Ohio Department of Highways, Ravenna

IN THESE days when roadbuilders are faced with a large and continuing volume of pavement widening and resurfacing, any new developments in labor-saving methods is news. Several special features in this category were employed recently in widening and resurfacing 5 miles of old pavement on Route 18 in Portage and Summit Counties, Ohio; McCourt Construction Company, contractor.

This project called for a 2-ft. widening strip consisting of 5 in. depth of granulated slag and 3 in. of bituminous leveling; plus a complete 2-course bituminous resurface comprising 1¾ in. of hot-mix leveling course and 1¼ in. surface course.

The special features brought out in construction of this job were:

Trench spreader box with screw feed developed and built by the contractor, McCourt Construction Company. (See photos No. 7 and 8.)

Use of motor grader with scarifier ahead of trenching machine.

Method of widening to eliminate the use of forms.

Method of rolling leveling course on 2-ft. widening.

Speed in which the five miles of widening was completed.

Scraper bar strike off attached to the back of Barber-Greene black-top spreader for leveling off material at center joint. (See photo No. 9.)

Here are the main details.

**Trench Spreader Box.** As shown in Photo No. 7 this box includes a screw feed operated by the motor mounted on the back and in the center of the box. The spreader is mounted on small solid-rubber-tired wheels and is far superior to the skid-type spreader. Photo No. 4 shows spreader in operation. The section of the box over the trench is adjustable to a 3-ft. width. Side plates regulate width of spread. Both plates extend down into the trench. The one on the pavement side prevents the hot-mix from spilling over on the pavement. A sliding gate is also provided to regulate depth of spread.

The method of hook-up to the truck is shown in photo No. 8. The truck is backed up to the spreader box and the chains fastened. The spreader is then pulled up close to the truck by means of a crank and windlass with a ratchet, to which the chains are fastened. The ratchet holds the box tight against the truck.

4. Showing special spreader box placing leveling course 27 in. wide on a 32-in. rolled granular base course, as part of stair-step edge construction which eliminates need of forms (Surface course in complete bituminous blanketing to provide 2 ft. added surface width)

Only two men are required to operate the spreader. A 6¾-ton load can be spread in 1¾ minutes.

**Use of Motor Grader with Scarifier Ahead of Trenching Machine.** Photo No. 1 shows the path of the scarifier and No. 2 the trenching machine in operation. Using a scarifier ahead makes the work of the trencher much easier, assures more uniform subgrade, and speeds up the trenching operation.

**Elimination of Forms** is done by adopting stair-step edge construction. The 5-in.-deep granulated base course was increased in width over the 2 ft. required width by the thickness of the total base, which in this case was 8 in., making a total width of granulated slag of 32 in. The width of the 3-in.-thick hot-mix leveling course was increased over the required 2 ft. by the depth of the course or to 27 in. The surface course of hot mix is spread 24 in., the required widening. The extra widening of each successive course provides sufficient stability for placing the succeeding course without breaking down the edge.

**Method of Rolling and Spreading 3-in. Leveling Course on Widened Section.** The 3 x 27-in. leveling course was spread 18 in. wide and coned above the pavement grade sufficiently to procure the 27-in. width when rolled. The first rolling is done with a tandem roller immediately following the spreading and only 6 to 8 in. of width is rolled. This rolling compacts the material when hot next to the pavement edge and provides a tighter joint.

**5.** Roller covers inner 6 to 8 in. of the 27-in. leveling width in first pass (beyond arrow), another 6 to 8 in the second pass (in foreground) as a means of bonding hot-mix with old pavement while outer material cools and stiffens

**6.** Trench roller then works over entire 27-in. width. Although not shown here, the roller is allowed to extend about 6 in. on the shoulder material and provide edge support to the leveling material

The second rolling is also done with a tandem roller and an additional 6 to 8 in. of width is rolled. (See photo 5.)

The third and successive rolling is then followed with a trench roller.

The lapse of time during the first two rollings allows the outer unrolled edge to cool and become more tackey so that when rolled it will not spread beyond the required width. With this method much more control of the width is secured, and by using the trench roller for final rolling much greater compaction is obtained.

Another feature when rolling the outside edge of the widening is that the roller is allowed to extend about 6 in. over on the shoulder, in which position it also compacts the shoulder material and provides support for the edge of the leveling course.

**Fast Time Made.** The 2-ft. (+) widening on this project, about five miles in length, was completed in four days.

**Scraper Bar Strike-Off Attached to Black-Top Spreader.** (See photo No. 4.) This scraper or leveling bar was installed to improve the center joint construction on this type of resurfacing. The bar attachment as shown is slightly tapered toward the right end. Slotted holes are provided to allow the blade to raise or lower according to the grade of the pavement, and the springs as shown provide sufficient weight for the blade to level properly.

This device has proven very satisfactory. It eliminates the use of one raker behind the machine and provides a center joint that is barely noticeable after compaction.

Gordon Klohn, project engineer on this job, took the photos and supplied the above data. W. M. Wardman is division construction engineer. The project is part of a state-wide contract resurfacing and repair program under R. O. Nelson, chief engineer, bureau of const., Ohio Dep. of Highways.

**7-8.** Details of the screw fed spreader box developed and built by McCourt Const. Co. Note rubber-tired wheels which reduce traction. See text for other details

**9.** This scraper bar on the back of the spreader levels off material at the center, resulting in elimination of a raker and in getting a less visible joint

# HOW IT WAS DONE

Labor and time saving job kinks and interesting construction features, noted by R & S editors in their travels or sent in by readers

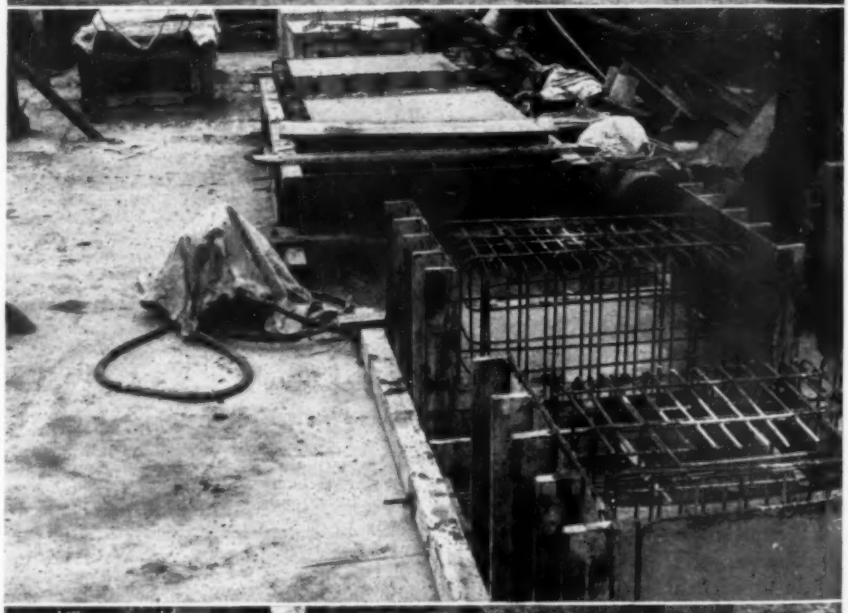
## *Precast Manholes Save Money on Eastern Airport*

A lot has been said about precast concrete manhole covers, but precasting the manhole boxes themselves is less often done. Over 120 such structures were built and placed this past summer on the runway extension contract of E. B. McGurk, Inc., at Rentschler Field, of Pratt & Whitney Aircraft Corp., Hartford, Conn., Austin Company, engineers.

A. I. Savin Construction Co., Hartford, which subcontracted drainage and other work, found that construction of manholes and drainage junction boxes by the ordinary method of excavating with a clambshell would be costly and troublesome due to sandy, shifting soil combined with a high prevailing water table caused by underlying clay. Sheeting would be needed, and the hole would require pumping. Precasting the lower part of the box offered definite economies of time, labor and equipment.

The boxes were cast in the contractor's yard several miles from the field, taking advantage of an outdoor overhead crane runway and concrete floor. The boxes were cast in a horizontal position, using ready-mixed concrete. One side wall was cast first, as a slab resting on the floor. Then the other three walls were cast. Reinforcing bars were tack welded into cages employing a simple frame template. After curing under wet canvas, the units, weighing 3 to 5 tons each, were trucked to the job and set off or lowered directly into position. Walls were keyed and doweled, and concreted on upward to the necessary height after installation.

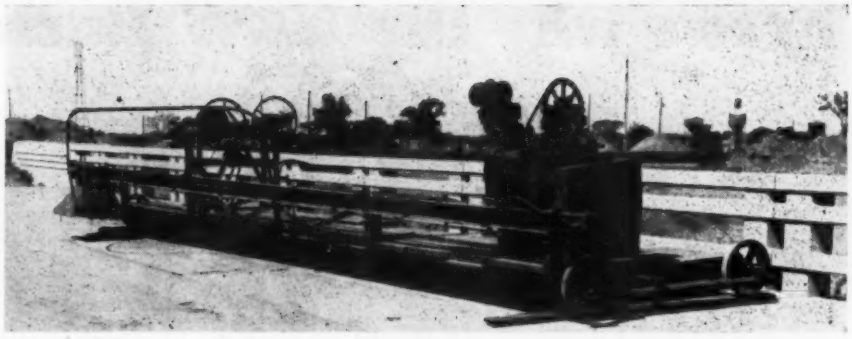
Pipe openings were made by tacking oval or circular blocks in the forms before precasting.



Typical of the 140 precast manholes built by A. I. Savin Const. Co. for airport job at Hartford. Lower views show manhole casting operation in Savin's plant yard near the job, and welder tacking reinforcing frames inside a wood template

## Machine Assures Uniform Curing Application

Among the innovations seen on the Detroit Industrial Highway Section 3 work this summer is a machine for applying membrane curing compound. Oak Construction Co. of Royal Oak, Mich., had just finished using it with good success on the Gate 10 River Rouge entrance highway at the time of our visit in July. Developed, we understand, by a local supplier of curing materials, this unit rides the forms and sprays an 18-in. wide swath across the pavement lane from a hooded spray bar. One hand wheel on the bridge moves the bar at a steady, predetermined rate, assuring uniform and thorough application. Another hand wheel propels the unit along the forms.



▼

## Two-Man Gravel Unloader

Many are the contraptions that have been devised to get gravel out of a gondola. Of course you can clamshell it out—IF you can spare a crane. But where one or a few cars of aggregate are to be unloaded at some isolated siding near a small job, Contractor Lee Millikan of Amarillo finds the portable unloading sling pictured here real handy.

This outfit consists of the following:

(A) A frame made of old pipe lengths welded together and braced in the corners. This frame has brackets which hang over one side of a car as shown.

(B) A heavy sheet iron pan or chute with sides about 8 in. high, which hangs over the side of the car. Adjustable suspension ropes control angle of slope desired.

(C) A drag skip for scooping up gravel and dumping it into the chute. Made of sheet iron and shaped very much like a small fresno, this skip has two handles and picks up about ⅛ cu. yd. (300 lb. or more) of material or about as much as one man can maneuver easily.

(D) A cable system, consisting of two winch lines from a truck (or tractor) stationed beside the car. One line is a "draw-back" line which passes over an overhead sheave, down to another sheave fastened on the opposite side of the car, and thence to the rear end of the scoop. Another line lowers the scoop or hoists and pulls it forward to load it, via another overhead sheave.

One man on the winch truck and one in the car, with a third man occasionally helping, can make quick work of a car of gravel.

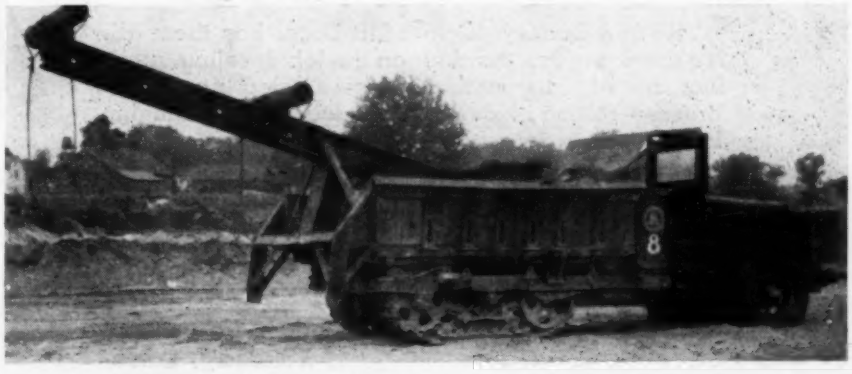
## Finishing Machine Moved Quickly With This Pick-up

Why waste time skewing or skidding your finishing machine around at the end of a lane run, when you can pick it up and set it down again with a truck?

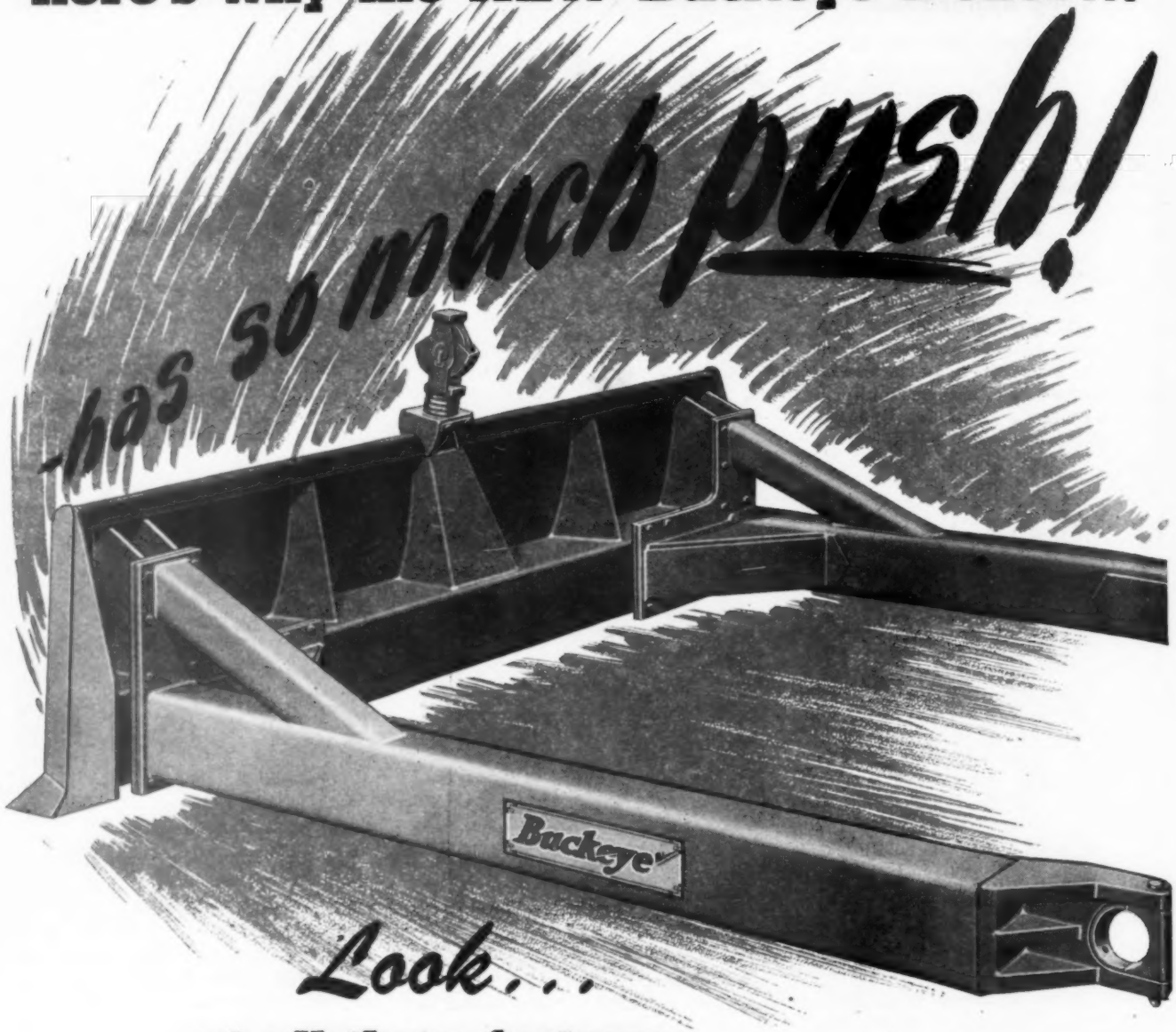
After reasoning thus, A. I. Savin of the Hartford contracting firm bearing his name, turned his shop men loose on the problem. The result is a neat one-man lifting outfit consisting of a Linn tractor on which is mounted a heavy raisable boom made of a section of steel I-beam with two welded steel cross arms. From these arms are suspended four lifting lines with loops which fasten to the four corners of the finishing machine.

After scores of move-ups the Linn driver has learned to pick up 'er and set 'er down in a few minutes.

The accompanying view of the pick-up was snapped at Rentschler Field airport of Pratt & Whitney Aircraft Co. at Hartford, where Savin is earth moving and subbing concrete paving for E. B. McGurk, Inc., general contractor.



# here's why the NEW Buckeye Dozer...




## at all these features

- Rugged construction
- Simple design
- Moldboard reinforced horizontally and vertically
- Sturdy push frame
- Curved blade to roll bigger loads
- No useless excess weight
- Natural digging action
- Straight direct center lift of moldboard
- Replaceable corner bits
- Reversible cutting edge
- Double trunnion tilt
- Powerful lift
- Unlimited digging depth
- Split-second, fraction-of-an-inch, finger-tip cable control
- Low friction loss
- Minimum cable wear
- Blade hugs radiator
- Heavy, closely spaced push plate supporting ribs
- High lift
- Balanced design

The new Buckeye Center Lift Dozer has them all. It's the dozer that can stay on the job, leveling, grading, back-filling, uprooting trees, clearing underbrush — rolling bigger yardage loads with minimum lost time for repairs and maintenance.

*Write today for specifications*

**THE BUCKEYE TRACTION DITCHER CO.**

**Findlay, Ohio**

## "Trussed Up Truss" Eases Load on Weakened Abutment

In Marion County, Indiana, last year one of the effects of a flood was to undermine and cause failure of a small-bridge abutment. Funds and materials for permanent repairs, let alone replacement, were scarce. So it was decided to close the bridge to all but local farm traffic and devise some means of partly relieving the dead load on the damaged abutment.

County surveyor, Paul Brown, and county highway supervisor Robert R. Fischer and their organizations, work ing together, came up with the rather novel solution shown in the accompanying photographs. The answer, briefly described, was to clamp a pair of salvaged 8-in. bridge I's along the top chord of each pony truss, then shore up the outer ends of the I-beams on the embankment back of the abutment, first throwing some rocks down to help support and spread the load. The weight of the bridge at this end was then partly lifted off the weakened abutment by means of turnbuckle hanger straps which passed down to an anchorage through openings in the end-post cover plates.

The clamped-on I-beams offered considerable bending resistance, which was increased by rigging eyebars (also of salvage bridge material) under the beams to make shallow pony trusses. The photos show this emergency strengthening after several months of service. County bridge foreman Fuller and R. D. Haines, bridge engineer in the county surveyor's office, helped put this scheme into effect.

## 2-Ton Trailer Relieves Big Trailer

Why send one of your heavy-duty platform trailers out to pick up a small mixer, pump, jog of lumber, etc., when a small 2-ton trailer would do it cheaper? Of course you can use an ordinary truck, but for toting bulky objects or loading units where there are no handy facilities for boosting them up into a high truck bed, the Ohio department of highways, Middletown division (Parker S. Bookwalter, div. engineer), prefers a small low-bed trailer.

As shown in the photo, it is of conventional design, including a frame made from salvage pieces channels iron bent into a goose-neck for clevising to the back of a trailer truck; wheels from a discarded light truck. A winch drum is provided back of the truck cab for drawing the load up a ramp and onto the bed planks.

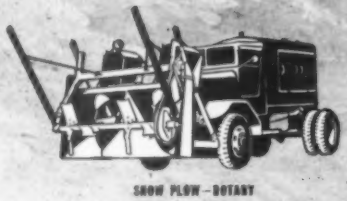
Ohio highway dept.'s 2-ton trailer which relieves heavy-duty trailer on light pick-ups such as small mixers, pumps, etc.

## Saves Form Wedges

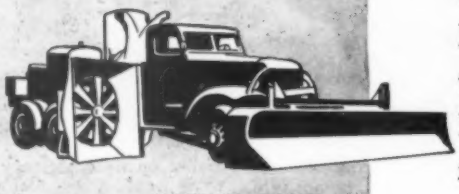
On any sizable bridge job many hundreds of wedges are required in form construction. These cost money to make, so why let them get scattered? And why not save and reuse them systematically? On Scott Construction Co.'s recent million-dollar concrete and steel highway bridge job on the coastal highway bridge Georgia, wedges were kept piled up on a handy platform under the bridge (see photo).

# BROS *Sno-Flyr* PLOWS

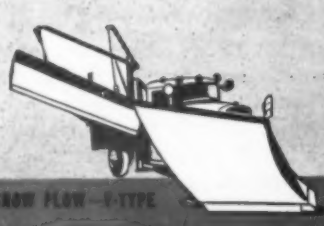
A TYPE AND SIZE FOR EVERY JOB REQUIREMENT



SNOW PLOW—ROTARY



SNOW PLOW—WIDENER



SNOW PLOW—V-TYPE

BROS designs and manufactures a complete line of "Sno-Flyr" plows. Big giant Rotaries for the toughest kinds of snow jobs—the sensational Bros Rotary-Widener for airport clearance and for widening roads by removal of snow banks from road shoulders—and the popular line of Bros V type and mouldboard plows.

Complete information promptly furnished. Write today for detailed literature.

# BROS *Snow* PLOWS

HEATERS CIRCULATORS

BULLDOZERS AND TRAILBUILDERS

V PLOWS ROTARY PLOWS

TURNING ROLLERS POWER WING ROLLERS

# Asphalt Maintenance in Washington, D.C.

## Methods of maintaining sheet asphalt, asphalt block and other bituminous pavements; work performed largely by contract

By H. C. WHITEHURST
Director of Highways,
District of Columbia,
Washington, D. C.

AN IMPORTANT part of our street maintenance program each year in Washington consists of the repair of sheet asphalt surfaces by the heater method. The downtown or central area of the city is paved almost entirely with this type of construction, mostly on concrete base, the total being some 6,127,000 sq. yds.

Prior to the advent of the heater, it was necessary to remove both surface and binder courses in repairing deteriorated areas in asphalt pavements. The surface heater method of repair, which replaces only the top ¾ in. of the asphalt surface, has come into common use in our general maintenance work. Heater methods developed through experience have made it possible to repair asphalt surfaces just as durably and more economically than by former methods of surface replacement. In many cases repair has justified the postponement of total replacement for many years. Surface heater patching requires only about 1/5 to 1/4 the tonnage of bituminous mix materials used in the old method of removing both courses down to the base.

This method also has the advantage of leaving undisturbed the underlying asphaltic material which has been compressed and "seasoned" by traffic. Though surface cracking or raveling has begun, the underlying material is usually structurally sound. The proper prescription is a surface sealing layer. Before asphalt surfaces are treated with the heater method, the Engineer thoroughly investigates the condition so as to make certain that there is no breakdown in the base course.

### All Work Done by Contract

Heater work and in fact all permanent pavement repair work in the District of Columbia has been performed by contract, it being the conviction of the District of Columbia Highway Department engineers that this is the soundest and most economical procedure. Half a dozen or more contractors have located in the District of Columbia and are well equipped to specialize in heater work and compete for contracts for this type of work. All have developed crews of workers having the special skill required for this character of repair. This results in there being a supply of experienced spreaders, rakers, heater operators and other craftsmen who move from contractor to contractor as work is undertaken.

From the start the Department took a close interest in the equipment used by contractors on this work and developed its own surface heater design. In use to this day—in fact, required in our specifications—this heater as manufactured by several equipment firms or assembled by the contractor, is somewhat smaller than heaters often employed in other cities. The hood is kept down to 4x5 ft., a size which requires a relatively small draft and correspondingly less heat and smoke, thus being less likely to damage the trees which the Nation's Capital city regards with such pride. Heaters can have either mechanical or hand blowers, as the contractor prefers. Hood details control the draft and are definitely specified. The height of hood is 10 in. in the rear and 4-in. in front. There is a draft opening across the top of the heater at the extreme front, 3 in. wide.

### No Definite Heating Temperature Specified

Whereas some paving authorities have given a good deal of attention to heating temperatures, the District of Columbia specifies no definite temperature for this type of work although the aim is to heat material to be removed to about 350° F. Experience has shown that the accumulated scum or layer of embedded oil, grease and finely powdered rubber from tires sets up a carbon which acts as insulation. Tests in the field made on adjacent heaters after 1½-min. and 10-min. heating periods respectively in-

Sheet asphalt repair work, Spring, 1944, on Connecticut Avenue in Washington. Extensive areas are being resurfaced in this block, working one side of the street at a time with seven heaters, three pick-up trucks and one 10-ton roller

# Your CLETRAC dealer CAN HELP YOU Keep your Tractor Fit . . . or help you get a New CLETRAC for essential use

KEEPING your Cletrac fit . . . helping you get the most from your equipment . . . that's the aim of your Cletrac dealer.

He is proud of Cletrac's part in the war. Wherever there's a tough job of movement . . . bulldozing . . . building military highways . . . constructing airfields . . . moving wheeled vehicles . . . jockeying grounded warplanes . . . aiding Engineers and Seabee crews opening communication lines, and keeping them open . . . in scores of difficult jobs Cletracs are a vital part of the "sinews of war."

And on the home front, your Cletrac dealer is doing his utmost to help keep Cletracs in fighting trim so that the fighting fronts may be supplied with the materials of war.

Here's how your Cletrac dealer can help you:

1. Assist you in obtaining necessary repair parts, and supply trained, expert service men to aid you in maintaining your Cletracs for dependable, economical performance.

2. Aid you in securing new Cletracs for essential uses.

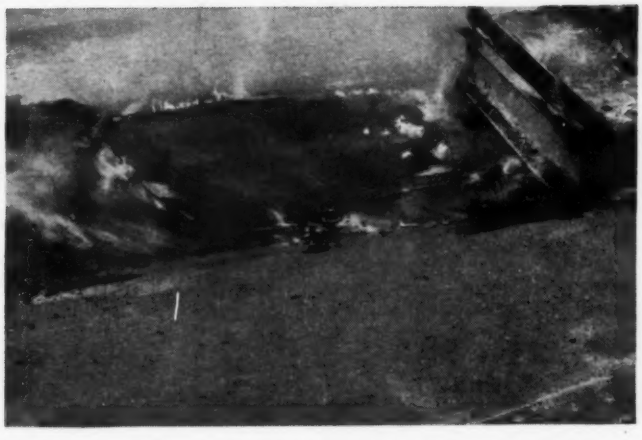
A substantial number of Cletracs are being released for essential civilian uses—allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

*The folder illustrated at the right tells briefly of Cletrac's part in the war effort. A copy will be mailed on request.*

**THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO**

**CLETRAC *Tru-Traction* TRACTORS**

GASOLINE OR DIESEL



(Upper views): Typical area with cracks, marked off with chalk line for heater repair. Cart used by the contractor for heating tampers, scrapers and rakes. (Lower views): Two views of areas immediately after heater application. Note thin curled "crust" of oil and rubber impregnated material. Washington practice is to heat for two minutes

dicate that there is little or no increase in heat penetration after 1½ min. A 2-min. heating period is usually sufficient to allow removal of the burnt material to the proper depth.

In conformance with usual practice, the resident engineer each day goes over the pavement ahead of the work and marks off areas to be patched or resurfaced. Then a battery of heaters, ranging from one or two up to six or eight, are put to work while rakers follow immediately, piling softened surface material into windrows for quick shoveling into trucks for removal.

The laying of new sheet asphalt hot-mix follows immediately after the heating and removal of the old material, while the underlying pavement is still hot and free from water, dust, or other foreign matter. If for some reason a portion of the scraped-down surface becomes cold or wet or covered with dirt or foreign matter, it must be reheated and if necessary rescraped before application of the resurface mix.

Hot shovels and rakes are used in spreading, as in laying sheet asphalt, and special skill is needed to apply the thin (¾-in. compacted) layer uniformly and with minimum overage.

Repairs by the heater method are performed under a general repair contract, the terms of which permit the repair of areas of any dimensions from small spot repairs to major repair projects of any size found necessary.

## Tight Bond Important

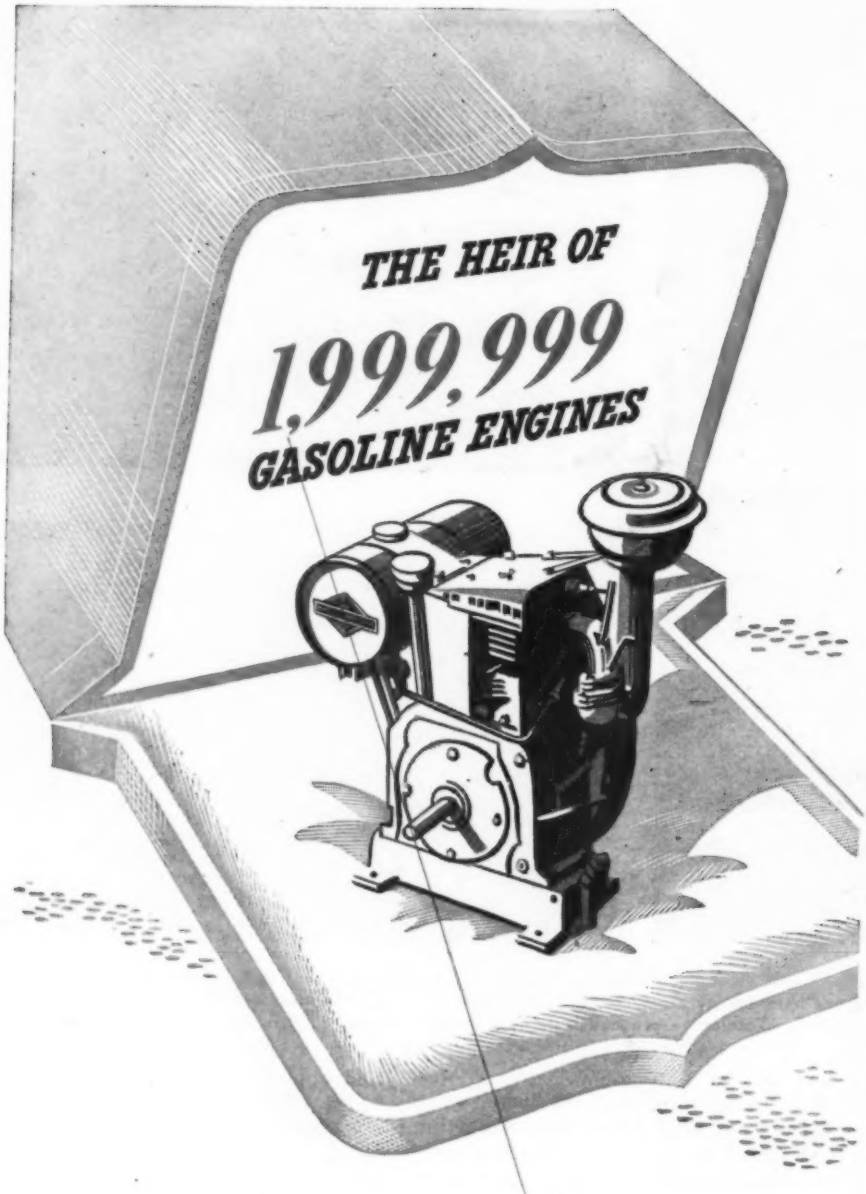
Special attention is given to getting a permanently tight bond with the adjacent pavement surface. In cutting joint edges with a hoe, the hoe is taken 1½ to 2 in. beyond the heater line, or as far as the material has been softened by the heater. Care is taken to leave a vertical edge, and not to compress or distort the sidewall material in cutting the edge.

In past years, when it was necessary to patch by removing the full 3-in. depth of top and binder, a tight bond between the new material and the surrounding pavement was difficult to obtain, thus lessening the sealing value of the patch. It was determined that this was due to the practice of trimming walls vertical and applying asphalt paint, the combined effect of which was to close the pores and leave a smooth, dense wall. This together with the impracticability of securing proper compression of the binder course resulted in the edges of the patch pulling away from the surrounding pavement and forming an open joint in some instances. The shallowness of heater resurfacing and the fact that it is a one-course operation have helped to get away from this separation effect. To further insure good bond, the cutter and raker see that the freshly applied mix joins with the undisturbed adjacent pavement in as uniformly and homogeneous a manner as possible prior to rolling.

Rolling with 8 or 10-ton tandem rollers completes the job. The burnt material removed in heater repairs is salvaged and is used extensively in surfacing temporary alleys and sidewalks in the outlying sections of the city. Its use for this purpose has proven satisfactory and economical.

Strict inspection is a tradition with this department, which normally employs 14 permanent and 10 seasonal

(*Continued on page* 79)




Recently the TWO MILLIONTH Briggs & Stratton engine moved off our production lines. We are now well started on the THIRD MILLION.

*Air-Cooled Power*

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

We of Briggs & Stratton are proud of the endorsement of manufacturers, dealers and owners — and proud to be recognized as leaders in design, engineering and research, as well as precision production — the results of *twenty-five years* of continuous production of air-cooled gasoline engines.
BRIGGS & STRATTON CORP., MILWAUKEE 1, WISCONSIN, U. S. A.

## Committee on Acquisition and Legal Control of Right-of-Way, Adjacent Areas, and Parking Facilities

A new committee has been created in the Highway Research Board, Department of Economic, Finance, and Administration, to be known as the Committee on Acquisition and Legal Control of Right-of-way, Adjacent Areas, and Parking Facilities. The functions of the committee include the initiation and execution of original research, the synthesis of efficient technique and existing practice, and the dissemination of information among the States, urban areas, and other local units of government, in the fields of highway right-of-way, access and roadside control, and parking facilities.

Land acquisition policy should implement the modernization of street and highway systems, rather than impede it as has been the case so often in the past, by facilitating land assembly at the minimum total cost, rapidly and adequately. To the end that large numbers of vehicles may travel safely with a minimum of obstruction and with a maximum of speed, highway authorities are beginning to think in terms of controlling highway access and effectively controlling the adjacent roadside development that is seriously detracting from the efficiency of the road system. Off-street parking facilities, particularly in the central areas of cities, should be recognized as completing the provision for over-all service from origin to destination, necessary for a full realization of the speed, economy and convenience of efficient highway transport. The legal, economic and policy aspects of these problems will be investigated by this group.

The following will serve on the committee, under the chairmanship of David R. Levin, Public Roads Administration:

Frank C. Balfour, chief right-of-way agent, Calif. Div. of Highways; J. L. Dickson, road design eng., Texas State Highway Dept.; H. S. Fairbank, deputy com., Dept. of Research Public Roads Admin.; H. E. Hilts, deputy com., Dept. of Design Public Roads Admin.; L. W. Kern, right-of-way eng., Maryland State Roads Com.; Theodore M. Matson, director, Bureau for Street Traffic Research Yale University.

H. J. Neale, landscape engr., Virginia Dept. of Highways; Flavel Shurtleff, counsel, American Planning and Civic Asso.; George S. Wehrwein, prof., Land Economics, University of Wisconsin.

(*Continued from page 77*)

inspectors on asphaltic work.

Perhaps the most famous of the streets kept up by the heater method is Pennsylvania Avenue, down which passes the inaugural procession of Presidents. Every four years its whole length from Peace Monument to the White House is gone over to insure a condition and appearance in keeping with this stately occasion. The present pavement was constructed in 1907 on top of another standard asphalt pavement that was laid prior to 1880. This pavement carries a low flat grade, with practically no crown. The grade of the pavement laid in 1907, including car tracks was raised approximately 10 in., thus providing adequate depth for the 1907 pavement.

## One-Course Patching

Another practice we believe worthy of note in the District of Columbia is that of eliminating the binder course when making small isolated repairs in two-course sheet asphalt or asphaltic concrete pavements. In replacing the base it is constructed to a level of 1½ in. below the surface, and a single layer of hot-mix sheet asphalt compacted by a ten-ton tandem roller completes the job. This practice has several advantages. Only two instead of three operations are required. Barricades can be taken down sooner, costs are reduced and a more satisfactory repair is made. This method of repair eliminates the imperfect hand tamping of the binder course in a two-course repair and results in the subsequent compaction under traffic being reduced to a minimum.

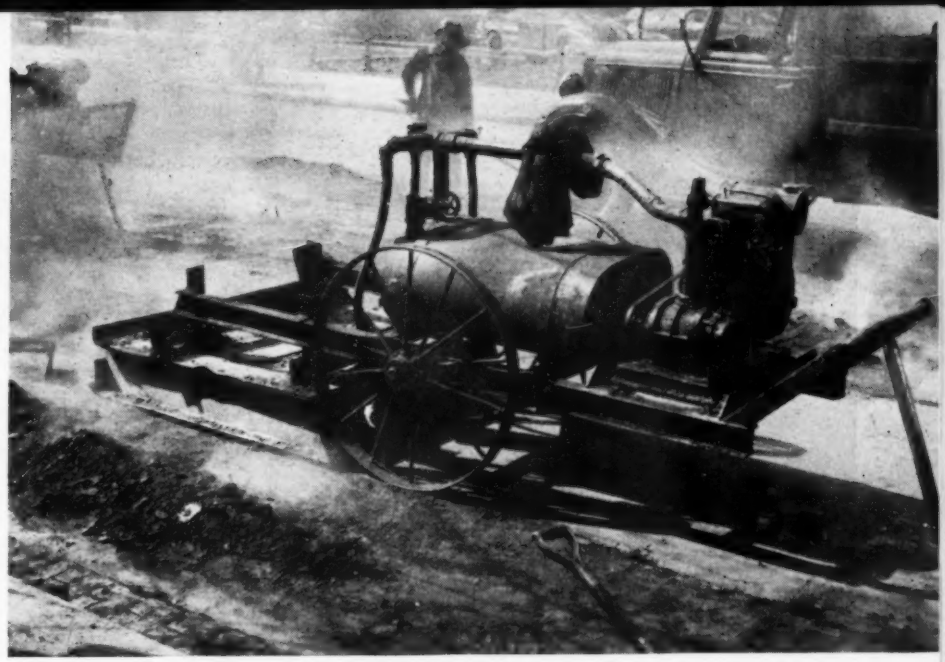
Another common practice in repairing bituminous surfaces is that of placing a "tread," ½ in. or less in thickness, over the entire street. This method consists of special cold-mix, machine-placed topping. It is employed in areas where the roadway is beginning to ravel, and is designed to seal the pavement surface. The old surface is first blown and broomed clean and 1/10 to 1/4 gal. per sq. yd. of thin emulsion tack coat (almost a mist) applied with a distributor. The old surface is heated along the gutter line to permit the new surface to meet the grade of the gutter and the entire roadway surfaced with a special topping mix of the following composition:

| | |
|---|---|
| Aggregate | 90.5 to 94.6 per cent |
| Liquefier | 0.4 to 1.5 per cent |
| Asphalt Cement | 4.5 to 7.0 per cent |
| Hydrated Lime | 0.5 to 1.0 per cent |

The exact proportions, within the above limits, are regulated by the engineer in charge of the work. The aggregate used is dustless limestone screenings, free from foreign matter, and composed of thin and elongated pieces. When tested by means of laboratory sieves it meets the following requirements:

| | |
|---|---|
| Passing a No. 4 sieve | 100 per cent |
| Passing a No. 8 sieve | 60 to 90 per cent |
| Passing a No. 50 sieve | 0 to 5 per cent |

The adequacy of performance in maintenance activities is reflected in the uniformly good condition of the streets. Maintenance standards have been set at a high level, believing this course to be the most economical in the end.



Heaters of small design are specified by the District of Columbia. Hoods are 4x5 ft. This unit was built by an equipment manufacturer who utilized a well-known standard small gasoline motor, blower, and V-belt drive. Note burnt material scraped into piles for shoveling into trucks

## Typical Heater Job

Contract quantities and bid prices, District of Columbia sheet asphalt street resurfacing (heater method) and incidental repairs. McGuire & Rolphe, Inc., Washington, D. C., contractor. Awarded February, 1944

| Item | Description | Quantity | Unit Price |
|---|---|---|---|
| 1-R | Sq. yds. cement concrete sidewalk replacements | 50 | $ 2.20 |
| 2-R | Cu. yds. cement conc. for base, conc. rdwys. and alley | 2000 | 19.80 |
| 3-R | Tons surface mixture for sheet or block pavements | 200 | 17.50 |
| 4-R | Tons binder mixture for sheet or block pavements | 100 | 15.00 |
| 5-R | Tons surface mixture for repairing cuts | 200 | 17.50 |
| 6-R | Tons binder mixture for repairing cuts | 20 | 15.00 |
| 7-R | Tons bituminous surface courses CM-A & CM-B | 500 | 16.00 |
| 9-R | Bbls. "special cement" to increase richness of mix | 2 | .60 |
| 10-R | Bbls. standard portland cement to increase richness of mix | 2 | 2.40 |
| 11-R | Lin. ft. of sidewalk expansion joint | 50 | .40 |
| 12-R | Tons surface mixture for use by heater method | 3000 | 18.40 |
| 13-R | Tons binder mixture for resurfacing by heater method | 20 | 15.00 |
| 14-R | Tons bituminous mixture CM-A & CM-B—Heater | 600 | 17.50 |
| 25-R | Sq. yds. cement conc. sidewalk 4" base & 1" top (2 course) | 10 | 2.75 |
| 26-R | Lin. ft. cement conc. curbing 8x9x14 | 100 | 1.25 |
| 27-R | Lin. ft. cement conc. curbing 8x9x15 | 10 | 1.30 |
| 30-R | Lin. ft. combination conc. curb & gutter | 50 | 2.40 |
| 31-R | Cu. yds. cement conc. for combination curb & gutter | 5 | 22.00 |
| 34-R | Setting straight 8x12 stone curbing | 50 | 2.00 |
| 35-R | Lin. ft. setting circ. 8x12 stone curbing | 50 | 2.10 |
| 36-R | Lin. ft. setting straight or circ. 8x8 or 6x20 stone curbing | 100 | 2.00 |
| 37-R | Lin. ft. resetting 8x12, 8x8 and 6x20 str. or circ. stone curbing | 50 | 2.00 |
| 45-R | Lin. ft. adjusting conc. or stone curb (straight or circ.) | 100 | 1.00 |
| 47-R | Lin. ft. stone curb removed and hauled | 75 | .60 |
| 48-R | Sq. yds. new vit. blk. gutter or alley entrance (BFBC) | 50 | 9.00 |
| 52-R | Adjusting D.C. manhole frame & cover & water V.C. | 20 | 7.00 |
| 54-R | Adjusting PUC manhole frame less than 6 sq. ft. | 2 | 1.00 |
| 55-R | Adjusting PUC manhole frame 6 to 16 sq. ft. | 2 | 2.00 |
| 61-R | Lin. ft. cement conc. traffic lane header curb | 25 | .90 |
| 62-R | Cu. yds. borrow excavation | 30 | 4.00 |
| 64-R | Lbs. calcium chloride | 3000 | .03 |
| 65-R | Cu. yds. cement conc. (specified mix) furnished DC | 50 | 9.00 |
| 66-R | Lin. ft. approved expansion joint | 50 | .90 |
| 67-R | Tons asphaltic conc. base course | 10 | 11.00 |
| 68-R | Tons sheet asphalt surface mixture furnished DC | 5 | 9.00 |
| 69-R | Cu. yds. excess grading | 50 | 4.00 |
| 74-R | Tons course aggregate base course (slag) | 500 | 10.60 |
| 75-R | Cu. yds. cement conc. for "Islands" | 10 | 33.00 |
| 76-R | Cu. yds. cement conc. to be placed on prepared sub-grade | 20 | 11.00 |
| 77-R | Cu. yds. cement conc. curbing and gutter | 5 | 30.00 |
| | **Railway Work (Along 2 Ft. Strip, Outside of Outer Rail, Street Car Line)** | | |
| 78-R | Tons binder mixture—replacement | 225 | $12.00 |
| 79-R | Tons binder mixture—Heater | 10 | 12.00 |
| 80-R | Tons surface mixture—replacement | 225 | 13.00 |
| 81-R | Tons surface mixture—Heater | 10 | 18.40 |
| 82-R | Cu. yds. cement conc. roadway pavement | 5 | 19.80 |
| 83-R | Tons bituminous mixture CM-A & CM-B—replacement | 100 | 16.00 |
| 84-R | Tons bituminous mixture CM-A & CM-B—Heater | 2 | 17.50 |

**52 Miles New Highway in Illinois Authorized**—Illinois Highway Department has received authorization from WPB for construction of 43 miles new 24 ft. pavement on U. S. 66 and 9 miles on U. S. 50.

Striping outfit used by the Corpus Christi state highway district. The aggregate truck pushes the stripe machine and tows the chip spreader and roller

# *How It's Done in Texas*

## For several years the Texas state highway department has striped an increasing mileage of its pavements with sealing asphalt and chips

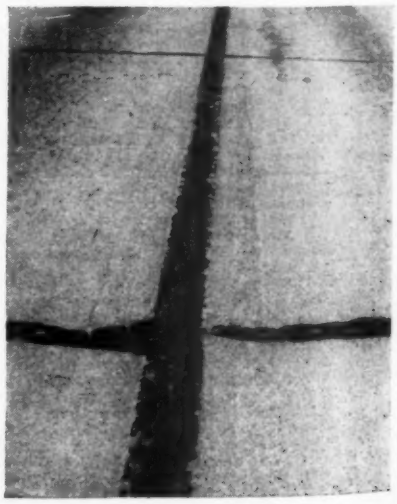
ACTUALLY the stripe is simply an ordinary seal coat, built 6 in. wide along the centerline. It consists of an application of quick-drying cut-back made with high-melting-point asphalt similar to roofing asphalt, over which is immediately placed a chip covering of ⅜-in. max. aggregates (graded down to 20-mesh) selected to contrast with the pavement in color.

Asphalt is applied at a rate equivalent to about .25 gal. per sq. yd. of surface or from 80 to 120 gal. per mile of stripe. White or light colored stone is used on dark bituminous surfaces, while on concrete and asphalt pavements of light texture a black trap-rock, obtainable at only one point in the state is used where the location is not too distant. The chips are given a light rolling with a roller towed by the same truck employed in stripe application.

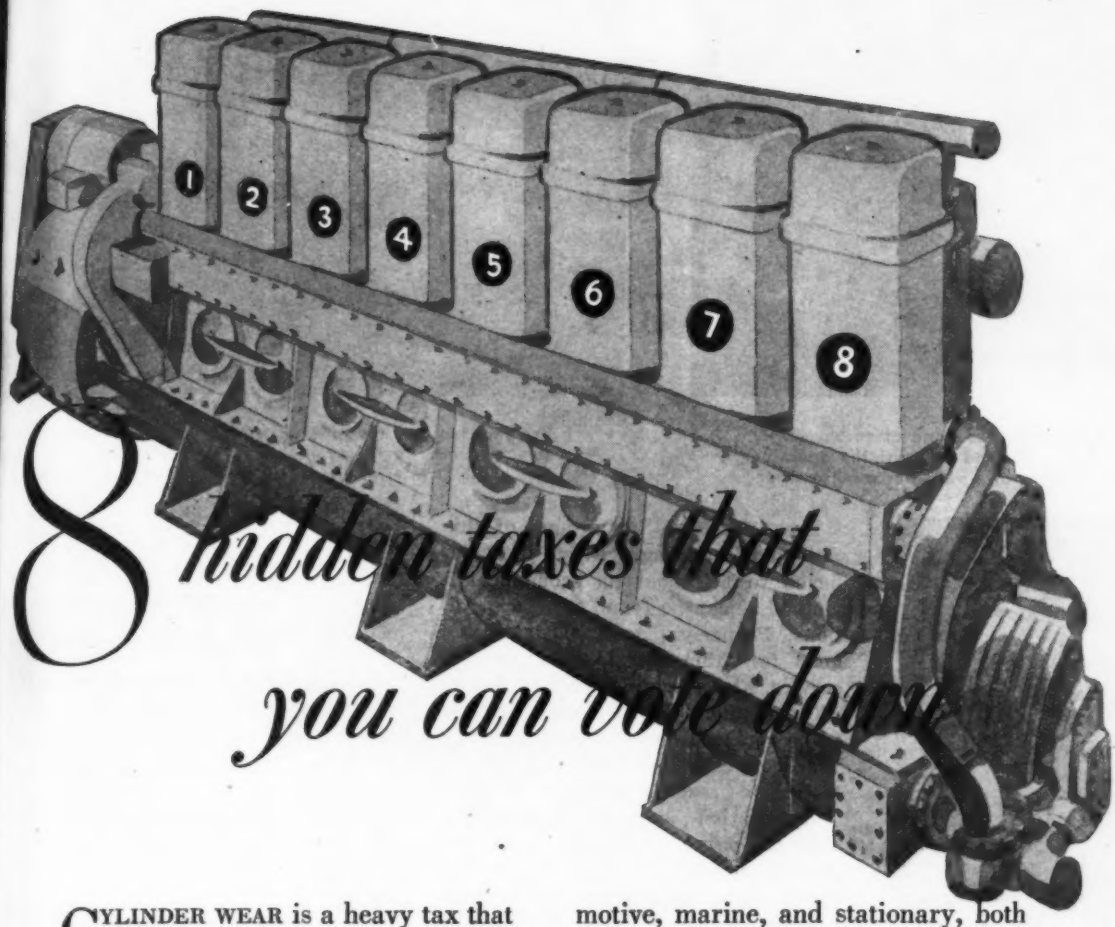
The completed stripe, to give best service, should vary little from ¼ or ⅜ in. total thickness in the experience of the department. A stripe of this thickness range has good durability. Its slight "raised edge" effect is noticeable to the motorist as his wheels veer over, and the stripe is visible above the water sheen during and immediately following rains. Some striping which has been built to ½ in. or more thickness has given too noticeable a bump to tires and steering wheels, and is not recommended from the standpoint of safety or public approval. Hence the size of chips and quantity of application must be controlled with care to get an accurate ⅜ in. maximum thickness. About 2½ cu. yd. of stone per mile gives best results as a rule.

The accompanying pictures show the striping machine of District 16 (Corpus Christi) at work. This is the district which first tried out the stripe back in 1939. Note that the truck carrying the cover stone pushes the machine and tows the roller. This is a rather compact unit, and one that has proved successful on hundreds of miles of highway.

The twenty-five state highway districts over the state use various methods of putting down the stripe. The highway department at Austin isn't concerned over the methods as long as the work is done well and economically.



Only a few stretches of stripe placed several years ago have begun to look like this. Improved technique in placement has lessened tendency to ravel.




# 8 hidden taxes that you can vote down

CYLINDER WEAR is a heavy tax that has always been paid on engine operation. It costs money, not only because it reduces efficiency, but also because it means shut-downs eventually.

You can expect four to twenty times longer trouble-free service from engines whose cylinder bores have been treated with PORUS-KROME.

PORUS-KROME has incomparably greater resistance to wear and corrosion than any other cylinder surface. Produced by the Van der Horst process, it is hard chromium which has tiny pores or pockets that act as oil reservoirs.

Experience in Europe and America in thousands of engines . . . aircraft, automotive, marine, and stationary, both Diesel and gasoline . . . has proved that PORUS-KROME multiplies cylinder life and reduces scuffing, ring feathering and risk of piston seizure.

Whether you are a builder or user of engines, here is a money value that you can measure in additional engine life.

The Van der Horst Corporation has three plants where PORUS-KROME is being applied to vital engine parts. Engine and parts manufacturers may also obtain licenses to use the process in their own plants. Our engineering services are available to those who are interested in PORUS-KROME for commercial application.

VAN DER HORST

# PORUS - KROME

*Good for the Life of your Engines*

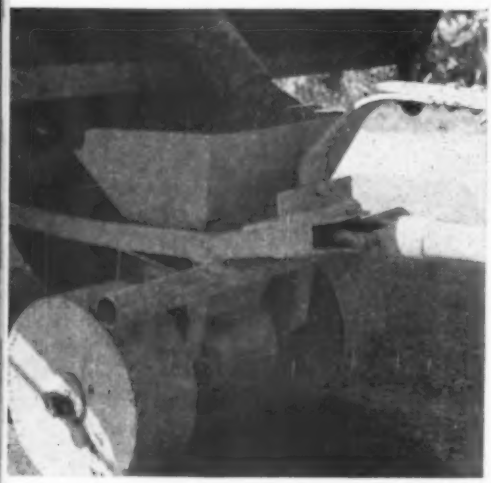
**VAN DER HORST CORPORATION OF AMERICA**

OLEAN • NEW YORK
CLEVELAND 11 • OHIO

AN AFFILIATE OF DRESSER INDUSTRIES

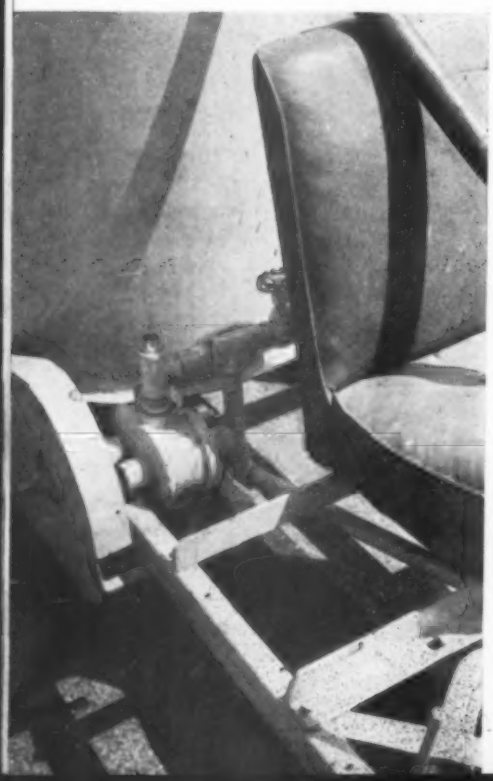
Note the pointer in the mirror following the edge of an old stripe. By this means the truck operator is enabled to assist the operator of the striping machine in the placing of a very workmanlike stripe

Filling the tank on the striping machine from a booster tank. In several Districts this delay has been eliminated by using a larger tank or a large distributor for interrupted operation



The hopper mounted on the rear end of the truck containing the cover stone and passing through a miniature spreader box onto the asphalt strip

A small gear pump operating directly off the axle provides for a uniform distribution of the asphalt regardless of the speed. Varying amounts may be applied by a slight adjustment on the pump



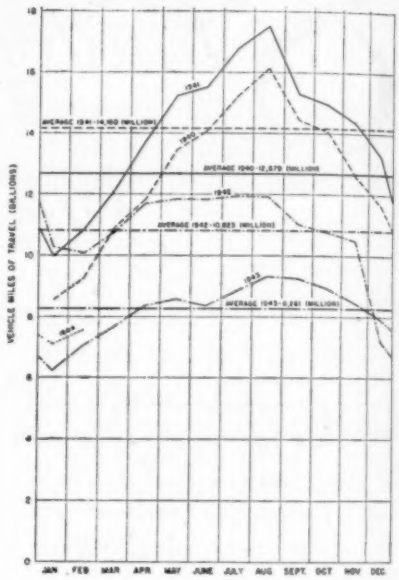
Now, as to the advantages of this method of striping. First, it is believed to be about as economical a method as can be found for the conditions. Properly placed, the stripe is good for from five to ten years of service, at an original cost of $18 to $30 per mile. Of course the stripe has to be replaced more frequently along very congested sections, at busy intersections and turns, etc.

Application is quite simple, and since the paint is covered over at once there is no need for a flagman behind the machine or for protective measures to keep traffic from messing up the stripe while drying.

In Texas the policy is to keep a clearly defined, continuous centerline stripe on all state highway pavements. Edges are sometimes striped, also, and multiple lanes defined depending on the acuteness of the need. Secondary, 4-in.-wide "no passing zone" stripes are put down on busier roads, consisting of 20-ft. stripes with 40-ft. intervals between. These are placed parallel to the centerstripe and immediately adjacent to it on the side of traffic being restricted, following standard practice.

## Highway Traffic—1940 to 1944

In connection with its monthly memorandum on traffic volume trends, issued recently, the Public Roads Administration included the accompanying chart showing the variation of traffic on old rural roads by months. Monthly indices of traffic were calculated for each year from 1941 to 1943, inclusive, from the automatic traffic recorder data, and these indices were used in distributing the estimated total traffic for each year. The estimates for January and February of 1944 were obtained by increasing the estimated volumes for the corresponding months in 1943 by the increases in total traffic for these two months which were indicated by the traffic recorder data collected in these periods.




Vehicle Miles of Travel on All Rural Roads —1940 to 1944 (by Months)

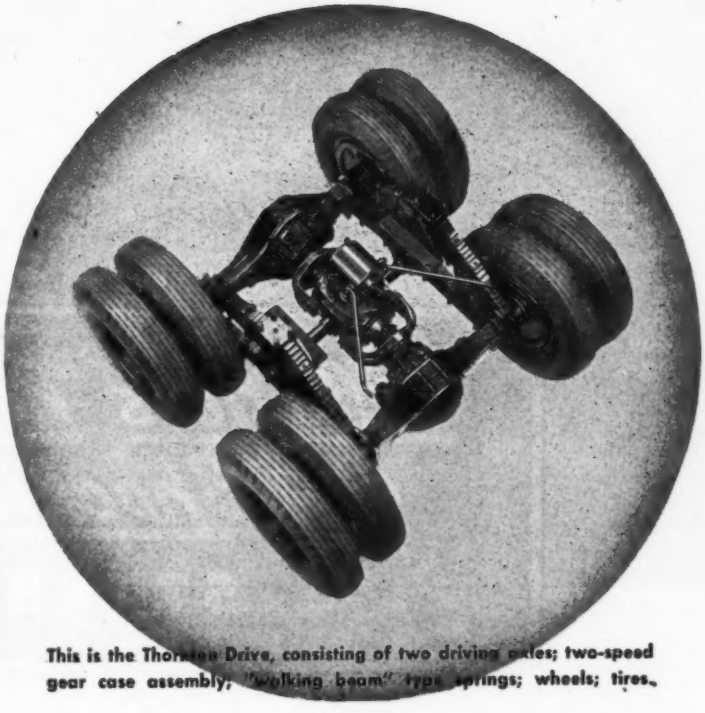
The curves in the chart indicate the growth of traffic which occurred between 1940 and 1941 and the all-time peak in traffic which occurred in the latter year. Traffic continued to increase slightly in January of 1942, but in February of that year the effects of restrictive regulations were felt and traffic fell below the estimate for February of the previous year. The effects of restrictions in the succeeding months are clearly indicated, especially the drop which occurred in December 1942 when gasoline rationing became Nation-wide. The curves indicate that, at present, traffic is recovering slightly, but a portion of this apparent increase may be due to the unusually mild weather conditions which have been prevalent over a large portion of the country in recent months. The amount of traffic in the succeeding months of this year will depend on the amount of available gasoline and probably will not exceed 1943 figures.

# HOW TO MAKE YOUR MEDIUM TRUCK EARN MORE MONEY

LOGGING

MINING

GENERAL HAULING



This is the Thornton Drive, consisting of two driving axles; two-speed gear case assembly; "walking beam" type springs; wheels; tires.

LUMBERING

OIL PRODUCTION

DUMP TRUCK WORK

## ADD THE THORNTON *FOUR REAR WHEEL* DRIVE! CONVERT IT INTO A HEAVY DUTY TRUCK

Whether you own, or expect to buy, a medium truck, you both save and make more money when Thornton properly engineers and installs this 2-drive axle BOGIE, thus converting a 1½-2 ton medium truck into a powerful, 6-wheel heavy duty truck, capable of delivering 100% *more* rim-pull which permits hauling 100% *more* payload through sand, mud, muck, snow, over ice and up steeper grades.

- Make your converted truck do double duty . . . haul twice as much . . . earn more money.
- Write today for full particulars.

### *You* SAVE *on*

√Investment, operation, upkeep.

√Gas, oil, tires, chains, wages, manpower, insurance, time-delivery schedules.

**NO PRIORITY**
**Installations readily available.**

**THORNTON TANDEM CO.**
8725-A GRINNELL AVENUE • Plaza 9700
DETROIT 13, MICHIGAN, U.S.A.

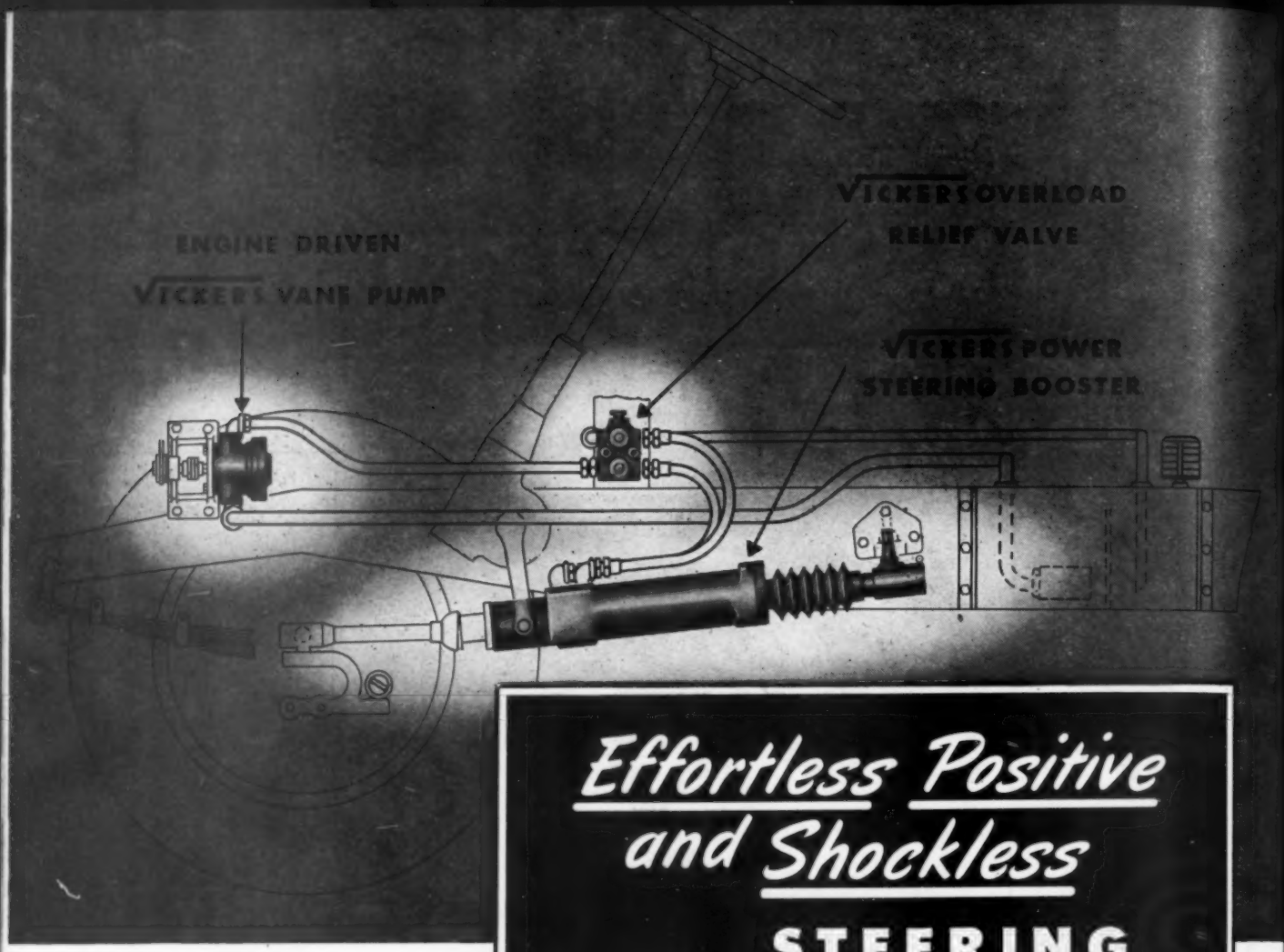
Investigate THORNTON *Automatic-Locking* DIFFERENTIAL for Replacement in Truck Axles

In Canada see: H. V. WELLES, LTD., Windsor

Thornton Tandem Co.
8725-A Grinnell Avenue
Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name_____
Address_____
City_____ State_____
Make of Truck_____ Year_____
Used for_____



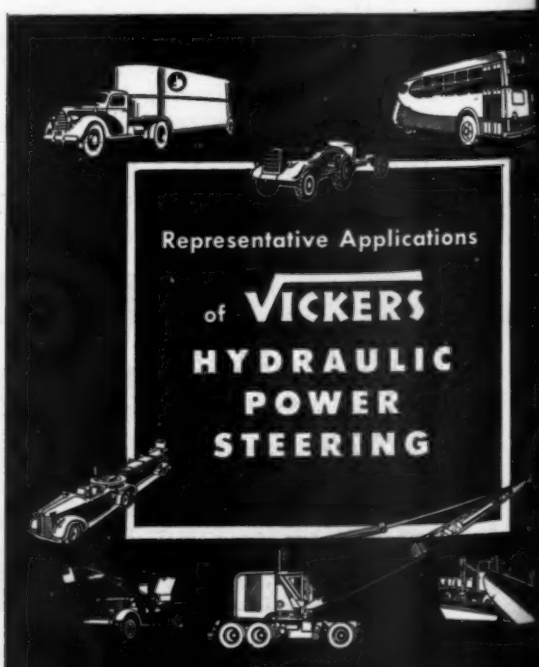

# *Effortless Positive and Shockless* STEERING

# VICKERS HYDRAULIC POWER STEERING

A giant truck steers easier than a "jeep". . . when that truck is equipped with the Vickers Hydraulic Power Steering System. The driver can turn the steering gear with his fingertips, and the front wheels follow exactly. All the work is done by a hydraulic cylinder (booster) which utilizes pressure from the engine-driven pump . . . the steering effort is not transmitted through the steering gear.

No road shock can be transmitted to the driver . . . road shock thrusts are transmitted to the frame instead of to the steering gear. With Vickers Hydraulic Power Steering, a vehicle can be driven over a curb, through sand, and on rough ground with no fight from the wheel. A flat tire will not cause swerving. If the hydraulic pressure becomes inoperative for any reason, operation automatically reverts to manual steering.

Compact . . . easily installed . . . simple . . . dependable . . . Vickers Hydraulic Power Steering is becoming a "must" on many heavy vehicles of all types. Write for details on this powerful antidote for driver fatigue. Ask for new Bulletin 44-30.




**VICKERS *Incorporated***

**1432 OAKMAN BLVD. • DETROIT 32, MICHIGAN**

*Application Engineering Offices:* CHICAGO • CLEVELAND • DETROIT
LOS ANGELES • NEWARK • PHILADELPHIA • ROCHESTER
ROCKFORD • TULSA • WORCESTER

# Elevated Highways Over Railway Lines

## . . . A bold feature of Atlanta's plan to solve post-war congestion, continuing R&S series on big-city traffic problems

By H. JAY WALLACE
Assistant City Planning Engineer,
City Planning Commission, Atlanta, Ga.

MOST of our metropolitan centers have acute traffic problems and only a few have satisfactorily solved them. The rapid growth of urban areas and the unprecedented development of motor transportation during the past 40 years have found most American cities with totally inadequate facilities to economically handle present-day vehicular traffic.

Narrow streets, irregular street patterns, awkward street intersections and poor parking practices are real hazards and congestion causes that should not be tolerated by any progressive American city.

Atlanta with 1940 population of 302,288 (metropolitan 500,000) has made several attempts to solve its traffic problem in the last score of years. Traffic surveys have been made and volumes of data compiled, but thus far recommendations offered and followed up have only partially solved the difficulties.

### Major Street Plan Advanced

The City Planning Commission, in cooperation with the Fulton County Planning Commission, has set forth certain pertinent facts and offered a major street plan which, in their opinion, will afford a tangible basis for having all interested parties confer and act upon in order to provide planned projects for the post-war period.

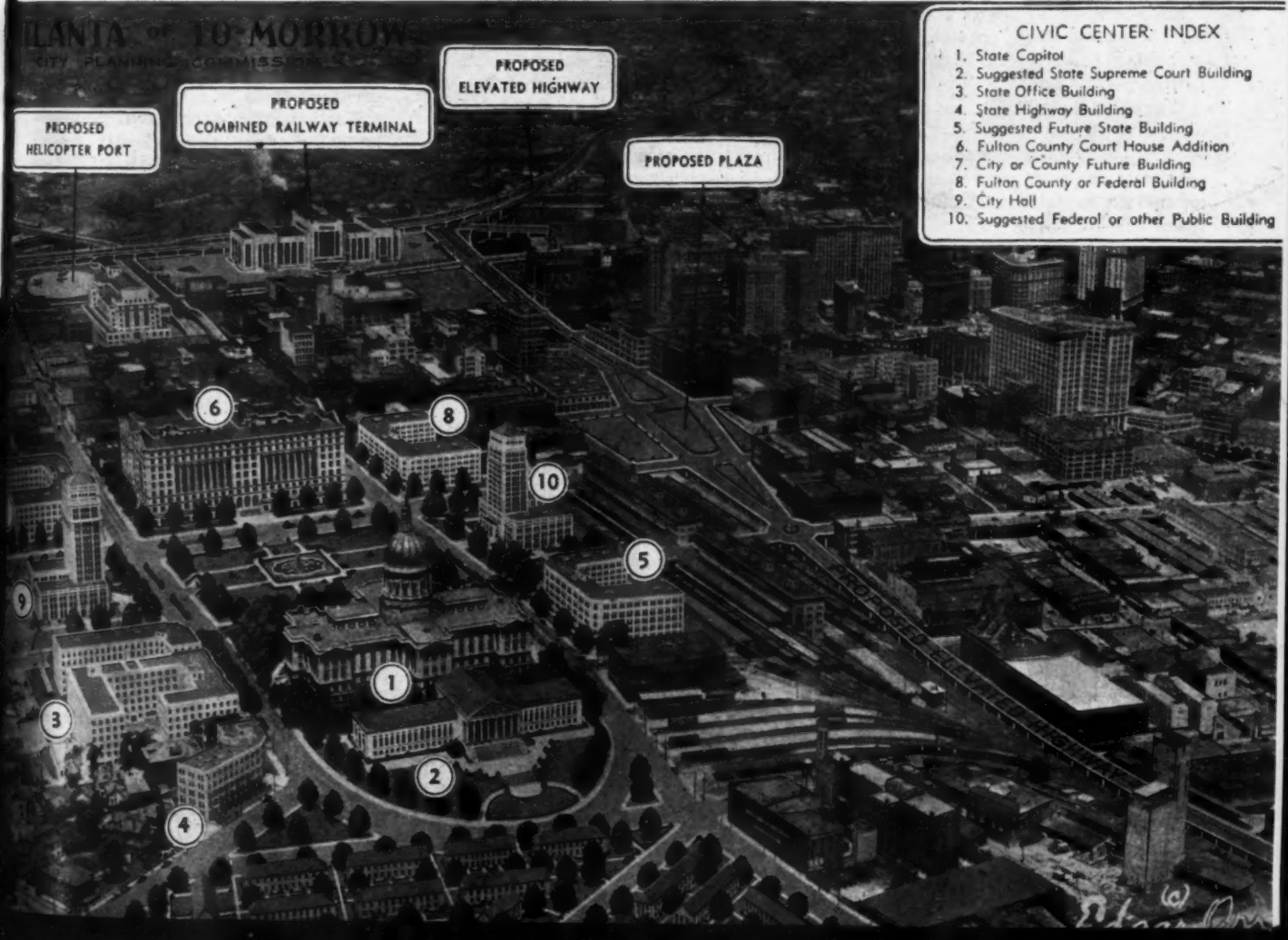
A few of the facts: In 1934, traffic counts showed that from 13,750 to 48,694 vehicles traversed the streets of the central business area on a typical spring day of 12 hours (6 a. m. to 6 p. m.); that the "peak hour" loads, morning and late afternoon, were 10.8% of the 12-hr. volumes or 1,485 to 5,259 vehicles per hour.

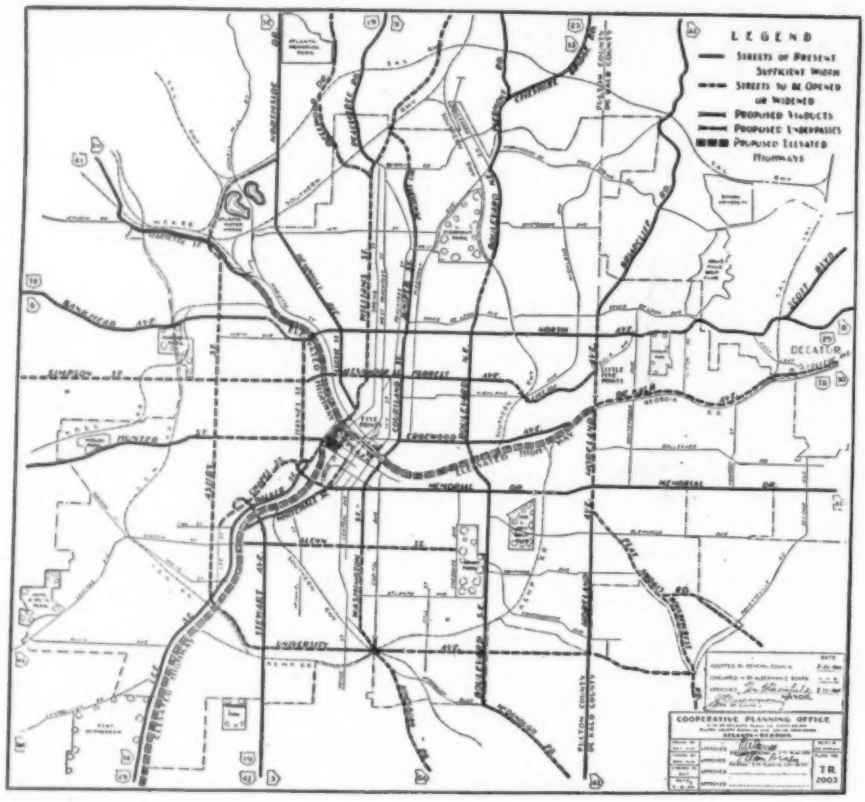
When traffic engineers state that a 60-ft. width pavement can satisfactorily accommodate 2,115 automobiles alone per hour or 1,215 vehicles (automobiles, street cars and buses) per hour, it is quite easy to understand why traffic moves slowly through Atlanta's central business area.

### Atlanta Driving Speed Varies

Back in 1929 a traffic survey made by the Metropolitan Life Insurance Company revealed that driving speeds through the area within one mile radius of Five Points (downtown center) varied from 4.0 to 24.9 mph., or an average of 14.45. Between the one-mile radius line and the city limits driving speeds ranged from 11.8 to 28.4 mph., or an average of 20.1. It is conceded by traffic engineers that 20 mph. is the minimum satisfactory speed for urban traffic and speeds below that figure are an economic loss to the community.

The deduction can be made that the real traffic problem lies within that


PROPOSED HELICOPTER PORT
PROPOSED COMBINED RAILWAY TERMINAL
PROPOSED ELEVATED HIGHWAY
PROPOSED PLAZA
CIVIC CENTER INDEX
1. State Capitol
2. Suggested State Supreme Court Building
3. State Office Building
4. State Highway Building
5. Suggested Future State Building
6. Fulton County Court House Addition
7. City or County Future Building
8. Fulton County or Federal Building
9. City Hall
10. Suggested Federal or other Public Building




one-mile radius of the center of the downtown business area. Certain parts of the outer area have their traffic congestion problems, but such problems are local in scope, while the central business area has a real overall congestion that creates an economic loss to all the citizens of metropolitan Atlanta.

Sigvald Johannesson, a recognized authority in the transportation field, in his book, "Highway Economics," estimates the cost per vehicle-minute, as related to delay in traffic, as follows:

Passenger automobiles, 0.75 cents; commercial automobiles, 1.47 cents; taxicabs, 1.38 cents; buses, 1.47 cents.

Average (based upon relative percentages of the type of vehicle to the total number of vehicles), 0.89 cents.

## Face $2,500,000 Loss

In 1941, latest normal traffic cordon count (made by the Boy Scouts) reveal that 228,428 vehicles traversed the central business area on a typical spring day. Assuming that each vehicle traveled one mile into the central business area and one mile on return, the total vehicle-minutes lost by traffic congestion delay (20 mph. minimum 14.45 mph.) equals 525,384. This figure multiplied by the average cost per vehicle-minute shows $4,675.84 daily, or $1,707,510.80 annual economic loss.

No estimate has been attempted on the economic loss in delay to individual passengers of mass transportation (street cars and buses), or in traffic accidents cost. Both sources would materially add substantially to the above figures. Furthermore, traffic engineers estimate that traffic in the post-war period will be 50% heavier than the normal prewar volumes, so the economic loss for the anticipated increase volumes will be even greater than 50%, since the average driving speeds will be more than proportionately lowered due to a more aggravated congestion on already crowded streets.

**It is conservative to estimate that the citizens of Atlanta will suffer a $2,500,000 annual economic loss due to slow traffic speeds alone in the central business area in the post-war period unless measures are taken.**

R. W. Torras is Engineer-Secretary, Atlanta City Planning Commission

## Odd Street Pattern

The odd street pattern of Atlanta's central business area makes the traffic problem difficult to solve. One-way streets, limited parking on certain thoroughfares, staggered hours and similar measures have, from time to time, alleviated but not permanently solved the problem. The big question is how to move traffic faster, smoother and safer, particularly at the "peak hours." Some have suggested that widening certain streets would help but past experience has shown that when streets in the central business area are widened, at high construction cost, the wider pavement usually provided just that much more space for parking and the resultant area for moving traffic was scarcely more than that before the improvement was made.

**To continue the practice of merely widening streets, in our opinion, will never solve the problem. Some cities have opened up wide parkways and radial streets through highly developed areas but the cost has been so great that most cities hesitate to follow their example.**

## Would Join Network

Providing that Atlanta obtains cooperation of the proper parties, she can install facilities that will enable the greater portion of her population as well as the transient public to enter and leave the central business area at satisfactory speeds and with greater safety.

Furthermore, such facilities would logically afford the urgently needed connections with federal and state highways and should be considered as part of the national network.

The railroads created Atlanta and have enabled it to grow rapidly into a metropolitan area of major importance. The growth of air and highway transportation has enhanced this importance. Close integration of all facilities is imperative in any master plan.

## Over-Railway Location Proposed

From a look at the map, the bands of railroad lines—through and around the city—would appear to hamper and retard the area's growth. True, railroads offer certain difficulties as they intersect arteries of motorized traffic and grade separations are necessary for safekeeping. **But, since railroads have created and developed the city, why shouldn't those same bands of steel afford the solution to Atlanta's traffic problem by providing the city with direct alignment and smooth grades for elevated highways over**

(*Continued on page* 88)

## WPB Removes Restrictions on 26 Types of Equipment

The War Production Board on July 24 removed restrictions on the sale of 26 types of construction equipment and made other changes to decrease paper work in the administration of Order L-192, which controls the manufacture and distribution of construction machinery and equipment and repair parts.

This action reflects an easing in the supply situation for certain items. No increase in the total volume of production is anticipated.

The 26 types of equipment are transferred from Schedule A of the order to Schedule B. Items listed in Schedule A may be sold to war agencies without restriction to other purchasers only upon specific WPB authorization.

One item—carrying and hauling scrapers with more than 15 cu. ft. capacity—has been removed from Schedule D, which lists items that may not be manufactured. These scrapers are now included in Schedule A. The change has been made to take care of a growing demand for large scrapers in mining operations.

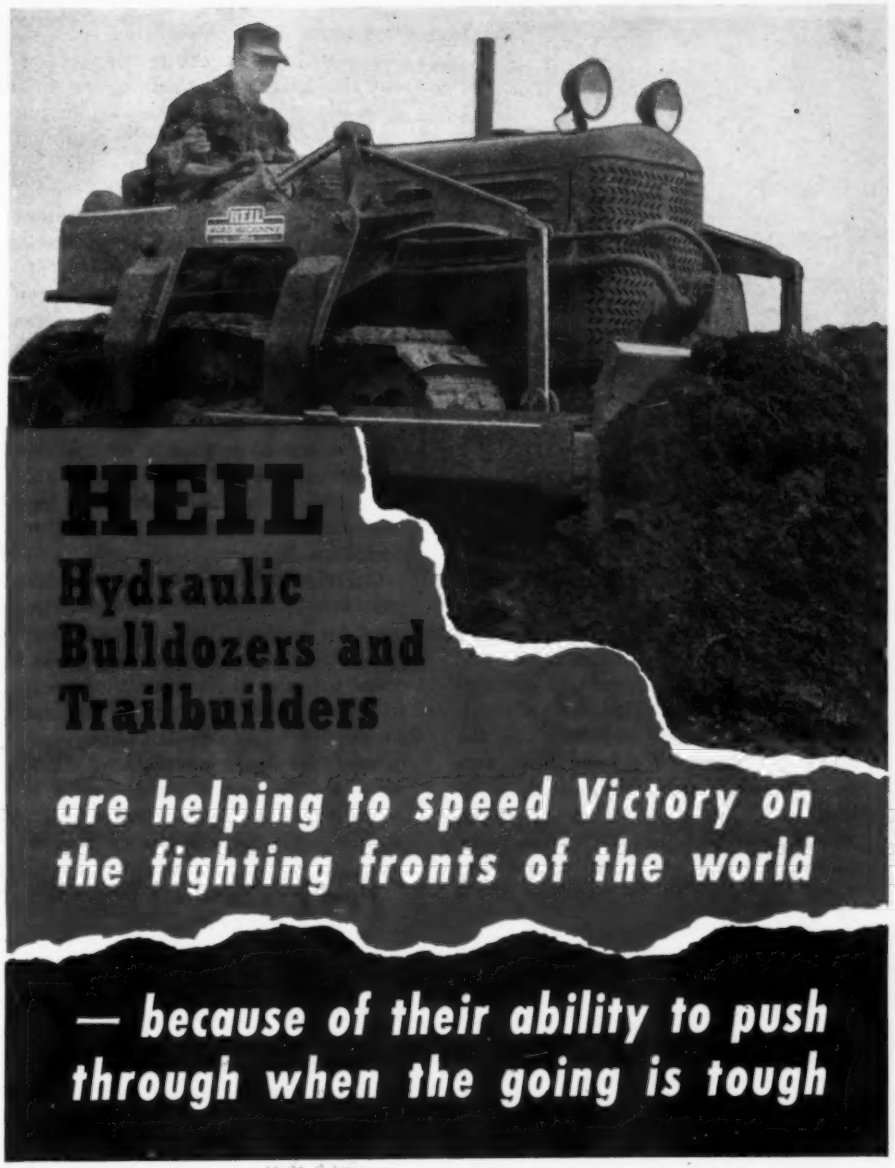
Items listed in Schedule B may be sold only on orders rated AA-5 or better. This provision was effective Aug. 3.

Provisions governing the manufacture and sale of repair parts for items in Schedule A remain substantially unchanged, except that export purchase orders for repair parts amounting to less than $100 are now exempt from the necessity of obtaining specific WPB authorization.

All restrictions on the distribution of repair parts for B items have been removed since the supply of these parts is reported adequate.

The 26 types of equipment that have been transferred from Schedule A to Schedule B are: Angeledozers and modifications (for mounting on tractors of 25 drawbar H. P. or less); contractors' rotary brooms; concrete buggies and carts (hand operated and power propelled); bulldozers and modifications (for mounting on tractors of 25 drawbar H. P. or less); concrete handling chutes; concrete surfacing machines, highway type; construction material conveyors, portable belt-type and for portable plants; contractors' and material handling derricks, guy and stiff leg stationary type; road discs, wheel mounted and harrow type for construction work; blade ditchers; rock drilling machines and modifications, hand held or portable mounted (except electric coal and core drills); self-propelled finegraders and subgraders; finishers and rodding ma-

(*Continued on page* 88)

**HEIL**
**Hydraulic Bulldozers and Trailbuilders**

*are helping to speed Victory on the fighting fronts of the world*

*— because of their ability to push through when the going is tough*

These efficient, dependable, Heil Bulldozers and Trailbuilders, are built to work as a smooth-operating unit with Cletrac Tractors.

Heil engineers have pioneered the modern practice of replacing heavy cast members with welded box sections that are lighter, stronger, and easy to repair in the field without costly delays. Sound engineering design, reduced to the utmost simplicity, guarantees few service interruptions and cuts maintenance costs.

Balanced loads, backed by full length crawler drive, result in effective digging and dirt-moving performance, plus big savings in maintenance costs on both blade equipment and tractor.

Enjoy maximum work and satisfaction with a Heil Bulldozer — designed to move "pay dirt" quickly, easily and economically.

R-34

See your Cletrac Tractor Distributor

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

The Atlanta planning commission has employed feminine talent to help alleviate the help shortage

them—leading directly into the central business area and, if need be, providing circumferential highways along the belt lines? With the increased use of Diesel locomotives and electrification of railroads, it certainly is logical to anticipate no difficulties from the old objection to the smoke nuisance. We have been successfully combating the smoke problem and, in the opinion of most authorities, that problem will be satisfactorily solved, whether or not elevated highways follow railroad rights of way.

### Scheme Advanced in 1916

The highway-over-railway suggestion calls for combining of railroad terminal facilities, recommended as far back as 1916, and a plaza, declared feasible by competent authorities. When the present terminal is replaced with a combined terminal, an area will be made available for a helicopter field, after the war. Thus, railroads, highways and airways can be integrated in an unusually satisfactory manner in Atlanta.

With the possibility of placing some of these public improvements in a "self-liquidating" category, it is being recommended that the elevated highways be on a toll basis and that parking automobiles be permitted on the plaza, with park meters thereon. These items of revenue, together with the removal of the major portion of the economic loss due to traffic congestion, would certainly make the project one that would "pay its own way." . . . We believe that the railroad interests will readily agree on the need for an adequate combined terminal, since site is available. In the proposed arrangement the handling of passengers, freight and express can be better segregated.

### Progress in State and Federal Cooperation

Atlanta's proposed Major Street Plan has been submitted to the Georgia State Highway Department and the PRA with request for their joint consideration of the various major streets as related to the establishment of Federal and State highway routes through the Atlanta metropolitan area. At this time, consideration is being given to an application for an "advanced engineering" program by the State and Federal agencies in order to assemble the necessary data for solving Atlanta's highway problems. This program would include modern streamlined methods for determination of traffic flows, present economic phases of the community as related to highway planning and the actual survey of highway routes as revealed by the economic studies.

Current or recent congressional post-war road bills stress the urgent need for modern highway facilities to penetrate the heart of urban areas in order to serve the majority of people, to correct the existing urban traffic congestion and to create public works in areas of dense population. At this writing it is anyone's guess as to just what the Federal government will set up for a post-war highway program.

### Need Is to Penetrate Downtown Areas in Cities

The Robinson Bill (H. R. 4915), which at this time seems to represent the present trend of thought on the matter, leaves the designation of the extent of metropolitan urban areas to the respective State Highway Departments and also leaves the way open for by-pass highways to supplant much needed highways that penetrate the congested central business areas of large cities. On the surface, it appears that the proposed program might be in danger of following the old procedure in highway development—that of avoiding the central business areas—and thereby fail to solve the real traffic problem of our cities.

**Should the Federal post-war program fail to provide for the penetration of central business areas with modern highways, the American public can continue to witness the decline of central property values, the accelerated spreading of suburban areas beyond corporate limits and a resultant lowering of the economic status in general.** The majority of U. S. cities are not financially able to construct the necessary traffic arteries and, since such arteries would be a logical part of a regional and national highway network, their installation should be a joint City, County, State and Federal obligation.

In spite of all the present indefiniteness of highway programs, Atlanta is assuming that a real effort will be made by all interested agencies to try to solve its traffic congestion problems.

Eventual Federal legislation, combined with the "advanced engineering" program of PRA and Georgia, cooperation of counties and other local corporate areas, will eventually result in a modernized highway network for Metropolitan Atlanta.

The City Planning Commission has submitted the proposed elevated highways and plaza project together with Atlanta's Proposed Major Street Plan as a practical solution to Atlanta's No. 1 problem—traffic congestion.

▼

## WPB Removes Restrictions

(*Continued from page* 87)

chines for wet concrete; concrete road forms; graders, under truck type; grapples, rock type; pile hammers; portable concrete hoppers; aggregate pulverizer mixers; cable-laying plows; snow plows (for mounting on tractors of 25 H. P. or less); road rippers; rollers, tamping and sheepsfoot; scarifier, complete machines, not attachments; concrete placing and material elevating towers, and logging wagons (wheel type).

▼

## Survey Underway of Post War Public Works Projects

A survey of contemplated public works construction has been undertaken by the Federal Works Agency for the Special House Committee on Post-War Planning and Policy. It is designed to list the status and dollar volume of post-war plans in each of the states and approximately 5,000 municipalities, counties and special taxing districts.

The survey will cover four stages of plan preparation ranging from projects for which bids could be advertised and contracts awarded within 60 days, to projects in the "idea" stage where construction is contemplated before 1950.

Information is to be assembled on nine types of projects to include only new construction, reconstruction, and improvements involving public works or facilities, other than Federal. The governors, mayors and county executives have been asked to report what funds or reserves have been set aside for financing post-war public works or the probable sources for financing them.

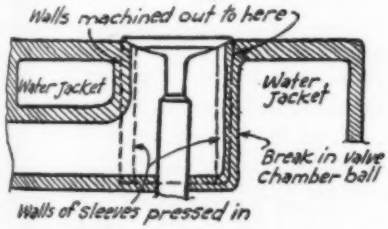
# Equipment Maintenance

## Wartime Kinks That Keep Jobs Humming

### Cracked Valve Chamber Repaired by Sinking Sleeve

Another neat job done recently by the Connecticut state highway department shop men is that of fixing a cracked block that maybe might have been junked in normal times.

The truck motor in question was of overhead-valve type. A hole had broken through the wall of a valve chamber into the water jacket. The mechanics first pushed the valve guide out. Then on an arbor they made a "fly cutter" which fitted into the valve guide passage. By turning the cutter in a drill press, they machine a circular well, cutting slightly into the walls of the chamber including the cracked wall. After machining down to a flat bottom, a sleeve was made to .005 in. tolerance and pressed in place, closing off the break in the well.



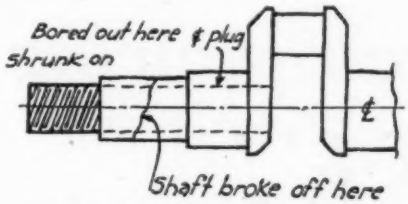

The exhaust port was bored through the new sleeve, via the old exhaust post. An extra metal hard seat was sunk into the top of the sleeve and a new valve inserted and ground to fit.

According to Ted Wilson, department equipment supervisor, credit for this job, which put a truck back on the road in two days, goes to Edward Koch, now in the state's shop at Lisbon, Conn.

▼

### Broken Chankshaft Fixed With Plug Shrunk on With Dry Ice

Among the emergency shop tricks that have worked for the Connecticut state highway department equipment men recently is the one sketched here. A truck motor crankshaft broke at the extension in front of the first main bearing (the part which operates the fan). A new shaft was not to be had, so the mechanics in the main shop at Hartford bored out the center part of the shaft on both sides of the break, as shown, then machined and threaded a plug from a piece of steel of about the same analysis, obtained from a broken rear axle in the salvage bin. A tolerance or crush of .006 in. was left, and the plug pressed in after cooling to below-zero F. by packing in dry ice.




The truck has been back in service seven months at the time of this report, and was still doing fine. (And still no arrival of the new crankshaft ordered at time of break!) Labor cost for this repair was about $12, or a small fraction of the cost of a new shaft.

▼

### Don't Waste Gases

#### Oxygen and Acetylene Are Critical War Materials. Help Conserve Them by Using Your Gas Welding Equipment Correctly

From *"The Maintenance Engineer,"* published by the Maintenance Division, Military Supply Office, Chief of Engineers.

Use the proper size torch tip. A No. 2 tip used instead of No. 1 for cutting ½-in. plate, for instance, consumes 10 to 20 per cent more oxygen, 16 per cent more acetylene.

Check hose and connections for leaks periodically. A leak as small as 1/64 in. in diameter will waste 290 cu. ft. of oxygen in 24 hours—more than a tankful. To spot leaks in hose, dunk it in water while under pressure. To check connections, spread a soapy water solution over them.

Close cylinder valves as well as torch valves when torch is not in use. When only torch valves are closed, gas pressure in the hose rises and may force new leaks, enlarge old ones.

(*See next page*)

Acetylene Pressure and Consumption Chart
Always use the smallest size tip that will do the job

| *Tip Size | Drill Size Tip End | Approximate Consumption in Cu. Ft. per Hr. Oxy. | Acet. | Pressure in Lb. at Each Regulator | Range in Inches |
|---|---|---|---|---|---|
| 51 | 63 | 5 | 5 | 1 | Up to 1/16 |
| 52 | 58 | 6 | 6 | 2 | 1/16 to ⅛ |
| 53 | 54 | 9 | 9 | 2 | ⅛ to 3/16 |
| 54 | 52 | 12 | 12 | 3 | 3/16 to ¼ |
| 55 | 48 | 21 | 21 | 4 | ¼ to ⅜ |
| 56 | 44 | 23 | 23 | 5 | ⅜ to ½ |
| 57 | 40 | 36 | 36 | 6 | ½ to ⅝ |
| B 68 | 36 | 50 | 50 | 7 | ⅝ to 1 |
| B 69 | 32 | 58 | 58 | 8 | 1 and over |
| B612 | 25 | 108 | 108 | 11 | Heavy castings, etc. |

*Smith Welding Equipment Corp. tips.

Pat. No. 2,280,275— April 21, 1942

# *Make your snow plowing SAFE!*

"BE safe rather than sorry." Equip each plow with KEYSTONE SNOW PLOW LIGHTS. Ahead and to the rear they flash a big warning in red, blue or amber, STOP. (Letters are 2½ inches high) that instantly attracts attention and can be seen through the swirling snow. These 80 times-per-minute flashes warn in time to avoid accidents. They protect the public—your men—your equipment. They're used by many states, cities, counties, towns, parks and bridges.

***IMMEDIATE DELIVERY CAN BE MADE***

KEYSTONE LIGHTS FLASH TO FRONT & REAR

**AUTO GEAR & PARTS CO.**

1410 WEST HUNTING PARK AVENUE, PHILADELPHIA, PA.

Keep tips clean and free of carbon and slag. Blocked orifices cut down efficiency and thus waste gas. To clean, select correct size drill and work it up and down in the tip with a slight twisting motion.

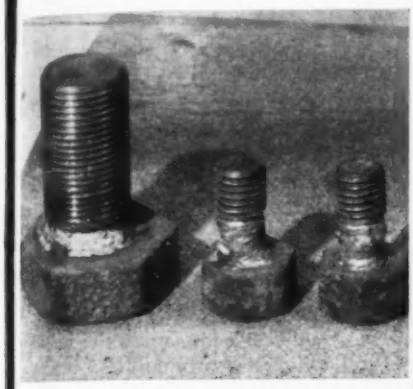
Use correct length of hose for the job. Surplus hose requires higher pressure to overcome pressure drop in hose, subjects hose unnecessarily to wear, and hinders the operator.

## Broken-Off Stud Bolts?

### *How to back 'em out quickly by welding on new nuts instead of having to drill*

How to get rusted stud bolts out when their heads have broken off is a problem that comes up every so often, too often, in fact. By now, the men in most contractor shops know the trick of welding a new head on the bolt and going at it again with more spit on the wrench. It saves drilling out the shank IF the head holds.

When bolts are really in there tight the heads will have to be welded on with plenty of "stick-um." We're indebted to the James F. Lincoln Arc Welding Foundation, Cleveland, for the following account of a successful method. It's from one of the Foundation's Award papers, "A Time Saving Method of Removing Broken Stud Bolts by Electric Welding," published in their "Maintenance Arc Welding." Alex F. Morton and Wm. F. Kramer, welders in the New York City central motor repair shop department of sanitation, authors.



Some of the many sizes and types of bolts backed out with help of welding in the New York City Shop. There are tricks to doing this job right

Undercut appearance, from use of Welders' Moulding Compound to protect threads around the wall above the break

**Problem:** Stud bolts broken off even with, or below the surface, of such parts as wheel carriers, brackets, cylinder heads, motor blocks, etc. Specially troublesome if of hardened type, these bolts dull or break drills, lose much time.

**Former method:** Drill a pilot hole down the center of the broken bolt; follow with a larger size drill which removes bolt nearly out to the threads; remove remaining shell with hand tools; run a top through threads to clear them for new bolt. Time: about an hour per bolt (often more).

**Welding method:** Build up broken-off stud bolt until level with surface, then weld over the built-up area a nut with a hole smaller than the stud bolt

with HEIL

Cable Dozers

you get more penetrating power at the blade . . . more yardage

Enjoy dependable, low-cost operation — move "pay dirt" economically

Heil Cable Dozers are doing an outstanding job in clearing the way for our armed forces. Just as you have profited by top-notch Heil performance in your earth-moving jobs, so do the Army engineers in their efforts to move dirt as quickly as possible with a minimum of delay for service and maintenance.

With Heil Cable Dozers, you get more drive — more penetrating power at the blade so that you can move more "pay dirt" with each load — quickly — economically. You get a clean-cut job — you can cut at a desired depth—accurately and smoothly. End-tilt adjustments and blade-angling are quickly and easily made.

Heil Cable Dozers are engineered throughout for "tops" in performance and savings for your pocketbook. You're money ahead when you specify Heil Cable Dozers.

*Write for bulletins*

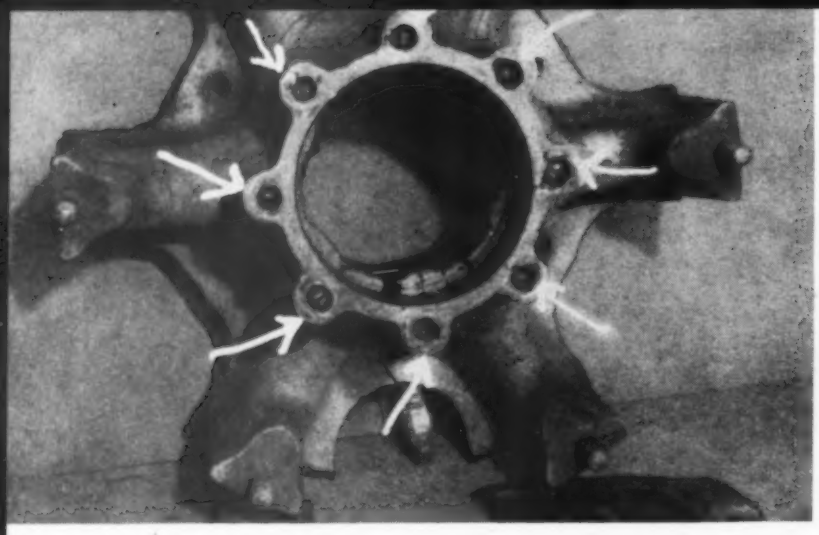
SEE YOUR INTERNATIONAL TRACTRACTOR DEALER

R 33

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN



Caterpillar drawbar rest bracket before and after removing broken bolts by welding in new heads

All eight stud bolts were broken off in attempt to remove by wrench from this truck wheel carrier

diameter. Or use a blank made of HEX stock specially for the job. Then use a socket, monkey or Stillson wrench and back the bolt out. Time, on one batch of wheel carriers, up to 20 bolts in 90 minutes, with an estimated 20% or more saving.

When several bolts are broken out of one unit, the welding operation heats up the body of the casting. This often helps remove the bolts on the first try.

In one instance reported, each leg of a wheel carrier where a bolt head was broken off was heated to a bright red, then the stud and the nut alone were chilled with water, after which they came out easily.

The photo showing six nuts gives a good idea of the various sizes of studs that can be removed, and how deep it is often possible to go in order to reach them.

The photo of a single bolt (from Caterpillar drawbar rest bracket) shows the undercut appearance which comes from using Welders Moulding Compound around the walls of the threaded hole over the break, to protect threads from arc spatter. This compound is now commonly used when there is a chance that the welding metal might tie in with the threads instead of the bolt top.

Morton and Kramer, in closing, said, "We do this job best with a heavy flux-coated manganese type rod, although this doesn't mean that some other high-tensile-strength type rod might not do it better. The heavy flux-coating helps keep the rod from welding itself to the sides of the hole, helps the welder build up where he wants it and not where the rod wants to go at times."

## How Mechanical Defects Can Rob You of Rubber

*(Additional excerpts from B. F. Goodrich Co.'s publication, "How to Prevent Truck Tire Failures," copy free on request to firm's Akron headquarters. See July R&S for first article.)*

Notice the number of vehicles on the highway with wheels that "wobble" or run untrue. Each wobble takes its toll in rubber as the tread is scuffed against the road. The left photograph illustrates one type of uneven wear which may be caused by one or a combination of conditions: (1) Worn or chipped wheel bearings, bearing cage, or inner or outer race. (2) Wobbly wheels. (3) Bent or sprung axle. (4) Excessive camber or caster. (5) Faulty springs or worn shackle bolts. Especially with faulty bearings, one tire on a dual wheel may be worn irregularly and its mate worn normally.

The center photo shows a tire which has been "cupped" by one or more of the above listed causes. In addition, the shoulders of the tread have worn off rapidly, the result of overload or underinflation. This wear on the shoulders can also be the result of other external mechanical defects.

The tire at the right shows practically all of its wear on one side, due to excessive camber or improper alignment.

Among other conditions which may cause irregular or uneven wear are out-of-round brake drums, high road crowns, highway curbs, bent or distorted wheels and rims, and too much toe-in or toe-out.

In addition to causing fast and irregular wear, many of these conditions actually cause blow-outs because of uneven and severe stresses and strains on the tire.

More rubber can be lost in a few hundred miles due to mechanical defects than would otherwise be used in many thousands of miles of service.

**What to do about it:** (1) *Let an experienced tire maintenance man investigate and prescribe the remedy;* (2) *As soon as the slightest irregular wear shows on tires, check and correct mechanical defects;* (3) *Switch wheel positions of tires to even wear.*

How tires look when something is wrong with your car or truck underpinning or steering mechanism

# Army Engineers: Spare Parts Distributors Around the World

## Repair shops hum back of the lines on every front to keep Army's heavy earthmoving equipment in action

"WHAT started out to be insurance is now an operating requirement of the first importance. What started out to be a combat reserve is now in the front lines."

This is the way Colonel R. C. Kuldell, Assistant Chief of Engineers for Military Supply, describes the increased importance of Engineer spare parts. The titanic task of keeping Army Engineer equipment on the job all over the world has emphasized preventive maintenance and spare-parts supply perhaps more than at any time in the history of the American equipment industry.

Spare parts are now such an immediate necessity for Army Engineer units that the basis of distribution is being converted from "reserve-insurance" to "immediate-replenishment." The conversion is making itself felt all the way from Columbus, Ohio, to northern Burma.

At the Engineer Field Maintenance Office in Columbus, the Army Engineers are running the world's biggest mail-order parts-supply enterprise. From this center of the maintenance activities for Army Engineers, the flow of spare parts and maintenance know-how reaches out through the ports of embarkation to base depots in the theaters of operations. From the base depots other parts-supply lines feed forward through sub-depots and Engineer Maintenance Companies to the front-line Engineer units whose equipment is taking the brunt of battle punishment. In the "echelon" chain of maintenance and repair, Engineer Parts Supply Platoons and Parts Supply Companies now constitute indispensable links in keeping Engineer equipment in running order.

The procurement and issue of spare parts from manufacturers and depots in the United States to the using organization at or near the front lines constitutes perhaps the most complicated channeling problem in the long history of the Corps of Engineers. It may be said that World War II is the first really world-wide test of America's heavy construction equipment. Operated under the pressure of battle conditions, this equipment has been very difficult to forecast in so far as maintenance requirements are concerned. Peace-time spare parts needs furnished no reliable guide for this type of use. Actually, heretofore there has been no basis other than some "educated guess-work" for anticipating maintenance needs.

### Floating Warehouse in Southseas

Examples of ingenuity in overcoming this tremendous problem of stock control are numerous. In the Southwest Pacific Theater, the Engineers for a time maintained a floating spare parts warehouse which made regular runs from island base to island base. Perhaps the extreme example of ingenuity, however, has been the maintenance of three pieces of American construction equipment left on the Chinese portion of the Burma Road when the Japanese marched into Burma. With spare parts manufactured in homemade machine shops by Chinese workmen who had never seen the machinery before, these three units had continued to operate.

The initial problems of spare parts supply in the theaters are now passing. The first period, when the theaters had almost no reserve supplies of parts, was succeeded by a second phase, when issue of parts sets to the theaters was made on an automatic basis without reference to the requirements of the theater—requirements which were then unknown. The flow of spare parts is now in a third phase. Requirements are increasing tremendously and constantly; but now supply is being geared to actual replenishment needs rather than placed on an automatic issue basis.

### More and More Equipment

The Engineer portion of the Army Supply Program, in contrast to some of the Army's procurement, continues to increase. Requirements for Engineer equipment are up generally 50 per cent for 1944 over 1943. The greatest increases are in such construction equipment as crawler-type tractors, cranes, generating sets, compressors, welding equipment, and pumps.

(Left): Using a South Bend 10-inch lathe to manufacture front idler shaft for a Caterpillar D-4 tractor at Engineer Shop, Milne Bay, New Guinea. (Right): Building up idler lugs on Osgood shovel base at Engineer shop, Milne Bay, New Guinea

Whereas in 1942 the Army's calls for tractors and cranes were approximately three times the then existing productive capacity, the Engineers are now confident that America's production genius will meet even the greatly increased goals for 1944. An Ohio tank arsenal has been converted to the manufacture of cranes; and new plants have been brought into production on crawler tractors.

In addition to production, getting the procured items into the hands of Engineer troops is itself a tremendous task. Engineer equipment has been in such great demand that centralized control has continued in effect on nearly all of the heavy construction machinery.

Ordinarily, first-echelon spare parts are furnished with each machine and shipped in the same crates with the machine. The using organization, responsible for both first and second echelon maintenance, replenishes those spare parts carried on the machines themselves from the second-echelon spare-parts sets supplied to each organization. These spare-parts sets match the exact makes and models of the equipment held by the organization.

Replenishment of second-echelon spare-parts sets is carried out by Engineer Parts Supply Platoons from forward spare-parts dumps, advanced sub-depots, or base depots. In emergencies, stocks of spare parts may be furnished direct to the using organization by the Engineer Maintenance Companies which are doing third and fourth echelon maintenance close behind the front lines.

The Engineer Maintenance Company secures its spare-parts supply also from the forward spare parts dumps and advanced sub-depots. Hence the importance of the Engineer Parts Supply Platoons which man these forward supply points. They are carrying an increasing load in the normal supply of parts to the various echelons.

Backing up all of the forward supply points and the Engineer Maintenance Companies, as well as the Heavy Shop Companies and Engineer Base Equipment Companies, is the theater base depot operated by an Engineer Parts Supply Company. These theater base depots get their stocks directly through the ports of embarkation from Zone of Interior depots.

Since February 1944 the automatic issue of spare parts from Zone of Interior depots has been discontinued except for certain theaters and certain short categories of supply. In place of automatic issue, it is now the responsibility of each theater to anticipate its own requirements and place requisitions for the specific amounts of spare parts desired as replenishments.

### Maintenance as Well as Parts

In addition to a closer control of spare-parts stock requirements, the job of keeping Engineer equipment in running order has meant increased emphasis on maintenance and repair facilities. The requirements for the motorized shop trucks of the Engineer Maintenance Companies, and the complex assortment of machinery carried by the Engineer Heavy Shop Companies, have more than doubled during the fiscal year 1944, placing a severe load upon the production and procurement of such equipment. Requests from the theaters have been carefully checked with other technical services in the Army Service Forces to eliminate duplications in theater maintenance facilities. To a great extent the successful preventive maintenance system set up for Engineer equipment in the Zone of Interior has now been duplicated in each theater of operation. Technical Manuals emphasizing preventive maintenance for individual items of equipment are shipped with the equipment to the using troops. Preventive maintenance has been drilled into all Engineer units as a regular part of their training and operation schedule.

### 300,000 Flow Charts

The greatest progress of all in parts supply, however, will be measured in the ability of Engineer using organizations to anticipate their requirements of the some 300,000 separate parts items on the basis of their growing—and now considerable—experience. When replenishment needs can be thus accurately forecast, the process of procurement, storage, and issue will be greatly simplified. The present system of procuring spare parts concurrently with end items—made necessary as "insurance"—may then be replaced by the less difficult system of bulk production and bulk delivery to theater base depots on a regular schedule.

Meanwhile, under operating conditions such as no construction gang ever was up against before, American Army Engineers are piling up an experience record and a test of equipment and spare parts distribution procedures that may prove invaluable when American roadbuilding equipment manufacturers and distributors can once again bid for the world's peacetime markets.


INTRODUCTORY—$10.00 PACKAGE

CONTENTS
Manganal
Special Tite-Kote
Welding Electrodes
5 lbs. 1/4x18"
10 lbs. 3/16x18"
5 lbs. 5/32x18"
Seaco
Hard Facing Electrodes
5 lbs. 3/16x12"

For Welding 11 to 14% Manganese Steel, Dipper and Shovel Teeth, Buckets, Gears, Pinions, Sprockets, Tractor Treads, Rollers, Grousers, Crushers, Pump Shells and Impellers.

FOR A.C. OR D.C. WELDERS

☐ Have your nearest distributor ship us (1) only $10.00 Introductory Package.
☐ Mail us direct one *FREE* copy of your new booklet, "The Welding of 11 to 14% Manganese Steels."
Name.....
Street.....
City.....
State.....

$13.67 WORTH FOR $10
Only one box to a customer.
Our distributors can make immediate shipment from their stock.

*Sole Producers*
STULZ-SICKLES CO., NEWARK 5, N. J.
MANGANAL ON THE AIR
*Tune In* CHET HUNTLEY, *Ace Newscaster*
8:55 Every Thursday Night
*COLUMBIA BROADCASTING SYSTEM* *Basic Pacific Network*

# TYPICAL DIESEL LUBRICATION PROBLEMS:

## 3. Ring-Sticking

Ring-sticking usually results from deposits formed by the combination of the residues of oxidized lubrication oil and fuel with fuel soot.

In four separate ways, RPM DELO prevents the formation of these deposits:

1. RPM DELO is manufactured from a carefully selected base oil containing natural inhibitors highly resistant to oxygen. It contains no heavy residues which may be left behind to act as a binder for the fuel soot.

2. RPM DELO contains an added oxidation inhibitor which greatly reduces the rate at which the oil absorbs oxygen.

3. RPM DELO has chemical detergent properties. The compounding material reacts with the oxyacids to render them essentially inert so that they are no longer able to polymerize to form gums and lacquers.

4. RPM DELO has peptizing properties which enable it to maintain soot and oxidation products in suspension in minute particles. This prevents these materials from settling from the oil and forming engine deposits.

RPM DELO, moreover, is non-corrosive to all types of bearings, does not foam and has very high metal adhesion qualities at both high and low temperatures.

RPM DELO is marketed throughout the United States and many foreign countries under the following names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Sohio RPM DELO, and Imperial-RPM DELO (concentrate).

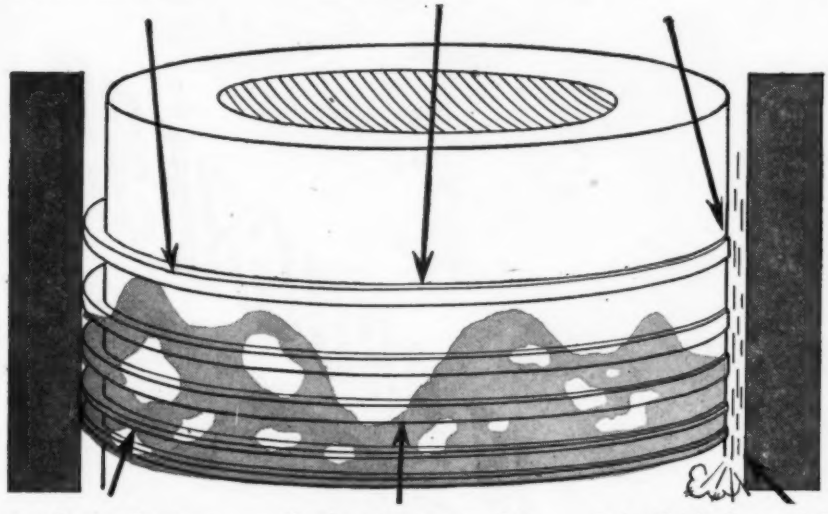
☆ ☆ ☆


## HOW RING-STICKING OCCURS

Decomposition products of fuel and lubricating oil deposit in ring groove, behind ring and in side-clearance space.

Rings stick in grooves, no longer expanding to form tight seal between piston and cylinder wall.

With seal broken, hot, high pressure gases "blow-by" stuck ring.



Escape of gases reduces compression, overheats piston, increases oil deterioration.

Blow-by pressure removes lubricating oil from rings and cylinder, leaving dry spots.

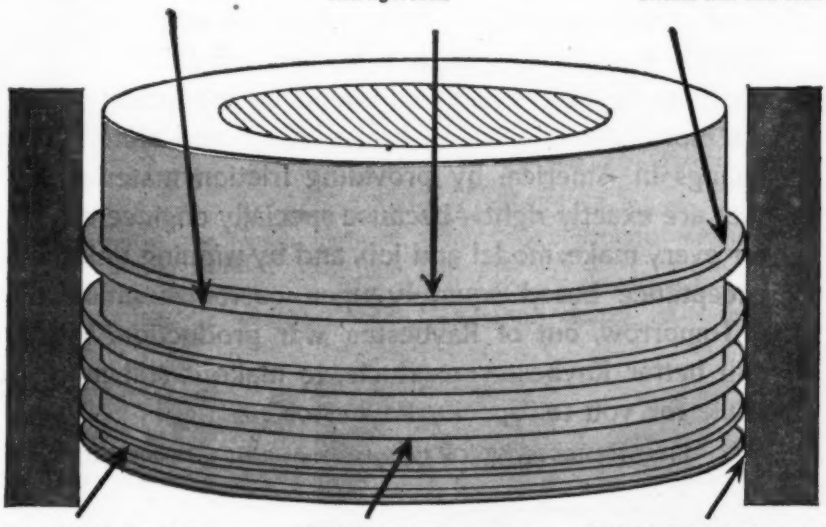
Lack of lubrication results in high ring and liner wear and scratching.

## HOW RPM DELO PREVENTS RING-STICKING

Detergent in RPM DELO prevents deposition of oxidation products.

Ring grooves are kept clear, allowing ring tension to maintain tight seal.

RPM DELO clings to ring surface, maintaining lubricant film and seal.



Tight seal eliminates blow-by, maintaining compression and power.

RPM DELO adheres to hot surfaces, protecting entire surface of rings, piston and liner.

RPM DELO lubrication results in minimum ring and liner wear, eliminates scratching.

RPM DELO

STANDARD OF CALIFORNIA

Comparing yesterday's transportation with today's is an eye-opener. ★ In this march of progress Raybestos has kept ahead, by producing the most complete line of brake linings and clutch facings in America; by providing friction materials that are exactly right—because specially engineered—for every make, model and job, and by winning universal acceptance based squarely upon customer satisfaction. ★ Tomorrow, out of Raybestos' war production, will come still better Raybestos products, to make it still more worthwhile for you to "specify Raybestos".

THE RAYBESTOS DIVISION of *Raybestos-Manhattan, Inc.*, BRIDGEPORT, CONN.

Raybestos

**FRICTIONEERS to AMERICA**

**INVEST IN AMERICA**
**BUY BONDS**

Manufacturing the most complete line of highest quality metallic and non-metallic brake linings and clutch facings for every type of equipment, war and civilian. Also fan belts and hose.

# ★ ★ With Road Builders in Uniform ★ ★

**From the South Pacific to England and from the Aleutians to Burma you'll find them serving today . . . the thousands of road builders who've gone out from contracting firms, state highway departments, and county, city and federal engineering posts. Here is news of a few of them. More next month. Send us your items!**

**Lt. Col. Harry S. Bronson**, formerly county surveyor of Ramsey County, St. Paul, Minn., has been in the Army for the past three years. He is now in foreign service.

Harry S. Bronson

William Day

**Lt. William Day**, former city engineer of Rockford, Ill., is in the Army Engineer Corps overseas.

* * *

**Lt. Col. William A. McWilliams**, former division engineer of the Highway Dept. of Delaware, has been in service since before Pearl Harbor and is a veteran of World War I (in which he enlisted at age 17 and was twice wounded).

William A. McWilliams

* * *

## Florida Engineers

**Edmund Friedman**, who was county engineer for Dade County, Florida (Miami), from 1932 to 1942, is an Engineer Captain stationed at Boca Raton, Fla. **George G. Mooney**, who was an assistant engineer with the county from 1936 to 1941, is a Major in the Engineer Corps on overseas duty.

* * *

## Montana Men in Service

**Lt. Col. Scott P. Hart**, U. S. Army, now stationed at Fort Douglas, Utah; formerly maintenance engr.

**Major W. E. Bawden**, U. S. Army, Ft. Baker, Calif.; formerly equipment engr.

**Lt. Myron C. Lockey**, U. S. Navy C. B.'s, Camp Clark, Calif.; formerly district engr.

* * *

## Nevada Highway Dept.

**Denton H. Hays**, formerly resident engr., now a Lt. with 45th Engineer Regiment; **Frank G. Lyman**, formerly chief draftsman, now a Major, Selective Service Office, Los Angeles; **Reuben E. Eldredge**, formerly asst. div. engr., now in the Army, North Ft. Lewis, Wash.; **M. E. Norton**, formerly bookkeeper, a Major, Selective Service, Boise, Ida.; **Alfred G. Kinne**, formerly div. engr. at Ely, Nevada, now a Lt. j.-g., Washington, D. C.

* * *

**Major William Harlow Bradford**, former chief accountant, state highway commission, Augusta, Maine, is with the First Quartermaster Battalion.

* * *

Among the 476 members of the Connecticut state highway department now in the armed forces are: **Robert S. Chidsey**, sr. highway boundary engr., now a Lt. U.S.N.R., C.B.; **Paul E. Flux**, asst. highway engr. (drainage), now Commander U.S.N.; **Howard S. Ives**, asst. highway engr. (bridges), Lt. Col. Army Engrs.

* * *

Louisiana Highway Department former Key personnel now in service include: **Lt.-Col. C. W. Peters**, now stationed at Washington, D. C.; **Lt. Col. R. P. Greene**, address unknown; **Maj. Warren C. Shankle**, somewhere overseas; **Maj. Joseph A. Holliday**, in foreign service; and **Maj. Gordon Johnson**, address not at hand.

* * *

Among former Colorado state highway department men now in uniform are: **P. S. Bailey**, former bridge engineer, now a Captain, C.E., address: P. O. Box 1027, Indianapolis, Ind.; **J. J. Marsh**, formerly supervisor Courtesy Patrol, now a Major, A. C., address: Orlando, Fla.; **J. S. Marshall**, formerly chief draftsman and designing engineer, now a Major, C. E., Post Engineer, Garden City (Kan.) Air Base; **W. E. Griffith**, asst. design engineer with highway. Now a Lt. Col., C. E. He has command of his own regiment and has built air fields in different parts of England and Ireland, Address: 398th Engr. Regt. A.P.O. 134, New York, N. Y.

W. E. Griffith and J. S. Marshall

Franklin County Engineer Allan Slade at Columbus, Ohio, sent us the smiling photo of **Capt. K. J. Mills**, formerly on his staff, who is on convoy duty in the Atlantic after seeing service on Gaudalcanal and other South Pacific campaigns.

K. J. Mills

* * *

## Penn. Highway Dept. Notes

According to Chief Engineer C. H. Buckius, Pennsylvania highway department's military absentees include quite a roster of former executives, among them the following:

**George Fisher**, public information editor, (Army officer, present rank not certain); **Wesley L. Hottenstein**, supv. highway forestry, (Navy Lt. j.g.); **Frank L. Strange**, asst. dist. const. engr., (Captain); **H. E. Thornber**, asst. dist. const. engr., (Lt. Col.); **Simon M. Lutz**, signal engineer, (Major); **J. Earl Buck**, dist. const. engr., (Captain, U. S. Engineers); **James E. Loughran, Jr.**, dist. const. engr., (Army); **Mark A. Messner**, supv. storeroom keeper, (Captain); **Harold S. Gahagan**, const. engr. Franklin dist., (Navy Lt.); **George T. Steidel**, bridge engr., Franklin dist., (Navy Lt.); **Philip Hartigan**, township engr., Scranton dist.; **Allen G. McMillan**, maint. engr., Allentown dist., (Navy Lt.); **Christopher F. Hill**, township engr., Allentown dist.

# Syracuse Saves Money on Snow Removal

By GEORGE BALLANTYNE
Commissioner of Public Works, Syracuse, N. Y.

LAST year the Department of Public Works of Syracuse, N. Y., saved almost $6,000 on its snow removal work and was able to operate successfully in spite of a 25 per cent labor shortage. Efficient handling of available equipment plus the extensive use of rock salt as a snow and ice remover in place of manpower enabled us to save the money and keep open our 400 miles of paved and unpaved streets and 250 hills in the city limits, just as effectively as we did in other years when labor was plentiful. We found that rock salt would do work that had been previously assigned to mechanical plows and to men with hand shovels.

### Use of Salt Extended

Using the salt to fight winter is not exactly new with us: for several seasons we have spread it on our intersections after storms. Last year, however, we extended our use of it to the entire street and gutter area in the business district, to sidewalks, and to hills and underpasses—about 100 miles of road surface, all told. In some cases we used rock salt alone on sections which in other years we had plowed. In others both salt and plows gave the city clean, ice-free streets in a matter of hours after the storm had ceased.

Winters in Syracuse can produce a lot of snow (from 16 to 18 in. through December, January and February) with freezing temperatures generally prevailing before and after a storm. We have to work fast to get the fall cleared away before it packs and freezes into ruts that present dangerous hazards to drivers and pedestrians alike.

### Advance Planning of Snow Removal Routine

Even though we had to get along last winter with three-quarters of the manpower we ordinarily use, we were able to plow the streets within 5 to 8 hours. To do this in so short a time we planned our snow removal routine in advance down to the last detail so that we could make every minute count. We worked out a complete system of routes for every plow and salt truck. As each one finished its assignment it came into the central station to get another detail. Time wasted going to and from assignments was cut to a minimum, and there was no time lost waiting around for new assignments. We couldn't afford that for in severe storms we sometimes had to go over the entire city three times within 24 hours with cinders and salt, a job that generally took from 3 to 5 hours each time.

With a light snowfall, we found that the salt trucks were often enough to clean the streets without the plows. When we had a heavy fall, the plows followed the salt trucks and were able to scrape right down to the road surface because the salt brine had kept the snow from bonding to the street. In either case, rock salt prevented freezing and speeded up the removal work.

### Applying the Rock Salt

To spread the salt we have six Butler distributors which we clamped on to the tail gate of our trucks. The trucks went down one shoulder and back the other, traveling about 8 miles per hour and spreading approximately ¼ lb. of rock salt to each square yard of street. We buy the salt in 100-lb. bags. All the worker on the truck does is stick a shovel through the bag, feed the contents into the hopper and save the paper for salvage.

In addition to one big store house and another smaller one, in which we kept about a carload of rock salt on hand through the winter, we placed salt and sand boxes at several points throughout the city at important intersections and under-passes. Police and motorists alike used them when necessary, before our trucks reached those areas. Our own men cleaned these stretches, of course; this was an emergency measure which we found very effective, particularly during severe storms.

We also hired several trucks located on the outskirts of the city to spread salt and sand on the hills before our men reached them. We have about 12 hills with steep grades in Syracuse, on which we spread the salt-sand mixture. For their trucks these men had a salt stock pile, which was replenished by the department.

In the business section our men cleaned the sidewalks too, using a small John Deere tractor with a plow attached to the front to push the snow into the gutter. Because of parking meters, fire hydrants, light posts and similar obstructions, this plow cannot maneuver in certain sidewalk areas. In previous years we hired ten men to shovel these sections, but last year we were not able to get anyone at all for this work. That left more snow for us to remove after the plows had gone through. In every case, we were able to remove it with rock salt. We also salted the gutters so that when building superintendents shoveled snow into them it would be melted down immediately. All told, our experience with rock salt was so good that we are planning to rely heavily on it once again this year as an important labor and money saver.

▼

## New Test for Air Content of Mortar Recommended

The extensive report of Committee C-1 on Cement, presented at the recent annual meeting of the American Society for Testing Materials, included recommendations on a new test for determining air content of mortar, determining vinsol resin, and a test for heat of hydration. Among the important specifications changed were those covering treated portland cement for pavements (C 175) which is now changed to cover air-entraining portland cement. Requirements permit the addition of Darex, an air-entraining material, studies of which are detailed in the report. Certain modifications and strength requirements have been incorporated in the standard portland cement specification (C 150).

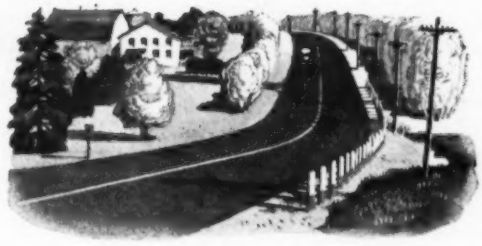
For convenience and utility, the widely-used methods of sampling and physical testing portland cement (C 77) have been divided into the respective methods covering fineness, soundness, time of set, etc.

▼

## Air Content of Concrete

The report of Committee C-9 on Concrete, presented at the recent annual meeting of the American Society for Testing Materials, contained several important recommendations involving various specifications, and particularly, tests. Part of the report was a discussion by J. C. Pearson on "Volumetric Method for Determining the Air Content of Freshly Mixed Concrete." The method was carefully compared with the existing standard and apparently gave nearly as dependable results with considerably less time and less computation involved. The effect of entrained air in concrete was covered in a paper by H. L. Kennedy, who stressed the fact that it is the air entrained in the fine aggregate which is responsible for the enhanced properties of concrete. He pointed to the danger of excessive entrained air which might result in reduction in cement content to the possible detriment of other properties than resistance to freezing and thawing.

# Quiz for road builders



**Question:** *How many miles of main trunk highways in your district?* _____ *What was the average cost per mile?* _____

There are 331,624 miles of main trunk highways in the U. S. Federal and State highway systems. The cost of building inter-regional traffic arteries ranges upward to $175,000 and more for a mile of super-highway.

**Question:** *How many miles of paved secondary roads in your district?* _____ *What was the cost per mile?* _____

There are 1,055,000 miles of surfaced secondary roads in the United States. Of this total, less than one third is actually *paved* mileage—yet adequate bituminous paving can be laid for as little as $5,000 per mile.

**Question:** *How many miles of unpaved roads in your district?* _____ *What mileage of post-war paving is planned?* _____

There are 1,547,000 miles of unpaved, unsurfaced county and local roads in the U. S. network. More than half of the entire mileage is still in the mud—yet from 10 to 40 miles of these roads can be paved for the cost of a single mile of main trunk highway.

# So what?

Simply this: We believe that the answers to these questions are the best possible advertisement we could write on the use of Barrett Tarvia in your post-war plans for a well integrated highway system serving the interests of *everybody* in your community.

For there is a right grade of Tarvia and a right Tarvia method for almost every type of highway construction. Tarvia roads are built largely with local labor and local materials. Tarvia provides maximum mileage of clean, skid-safe pavement for the people in your community, county or state.

Why not call in the Tarvia field man?

**THE BARRETT DIVISION**
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

New York . . Chicago . . Birmingham . . St. Louis . . Detroit . . Philadelphia . . Boston
Providence . . Rochester . . Minneapolis . . Cleveland . . Columbus . . Toledo . . Youngstown
Syracuse . . Buffalo . . Cincinnati . . Bethlehem . . Portland, Me. . . Bangor, Me.
Norwood, N. Y. . . Cromwell, Conn. . . Norwich, Conn. . . Savannah, Ga. . . Norfolk, Va.
In Canada: THE BARRETT COMPANY, LTD.: Montreal, Toronto, Winnipeg, Vancouver

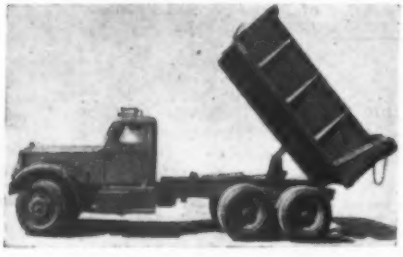
Barrett Tarvia*

*Trade-mark Reg. U. S. Pat. Off

# New Equipment and Materials

## New Line of Twin Arm Truck Hoists

Another development to come out of the war is the standardization of a line of new twin arm hydraulic hoists suitable for all makes of trucks and trailers and all styles of bodies by The Heil Co., Milwaukee, Wis. The new Heil hoists have been greatly simplified and save over 300 lbs. of dead weight on an 1800 lbs. unit. They are completely fabricated and welded, require no heavy castings, eliminate many rollers, cams and gears, and permit operators to carry a greater payload on each trip. The hoists are stated to be capable of lifting loads of 24 tons to 50° dumping angle in 10 to 15 seconds. The operation is smooth and noiseless and the body can be stopped and held at any angle without undue strain on the hoist mechanism. Loads may be dumped efficiently even when the truck chassis frame is twisted because of uneven ground.

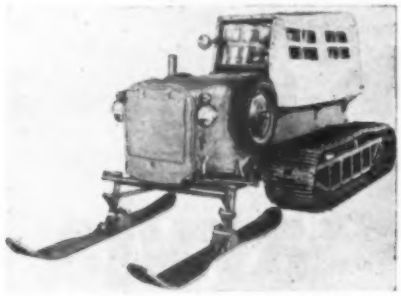


Heil twin arm hydraulic hoist

▼

## New Snow Tractor and Trailer

The Allis-Chalmers Mfg. Co., in cooperation with the U. S. Army Ordnance and Army Air Corps, announces the development and manufacture of a special snow tractor, Model M-7 and a 1-ton snow trailer, Model M-19, which are making their appearance regularly in Alaska and the Aleutian Islands with our Armed Forces. Since the front axle can be equipped with either wheels or skis, this two-man snow tractor with trailer is especially suitable and practical for either snow travel or highways. Long, wide tracks with rubber faced shoes spread the tractor's weight and prevent its sinking into the snow, at the same time assuring maximum traction under all conditions. The snow tractor and trailer were initially constructed as a rescue squad combination which could speed over snow covered topography to the aid of downed pilots and their crews. A trailer was specially equipped for this purpose by the Air Corps, containing two litters, a heater and a heavily insulated canopy top. Additional Air Corps requirements were met through the use of the trailer as a mobile starting unit containing an aircraft engine heater to assist starting in sub-zero climates. In addition the tractor and trailer serve as a transportation means for hauling supplies to our Armed Forces stationed in distant, frozen climates. The various trailer units may be equipped with wheels or skis, as conditions warrant. The tractor which is powered with a 4-cylinder, 4-cycle gasoline engine, developing 63 H. P. at 3900 R. P. M., has six forward and two reverse speeds, ranging from 4 miles per hour to 41 miles per hour. Reverse speeds are 3 mph. to 11 mph. depending on the speed range employed. Because of its low center of gravity, the tractor can easily climb slopes that may be as steep as 45 degrees, depending upon the traction available and the load being pulled. The trailer has a load capacity of one ton, while the unit itself weighs 640 lbs. including the insulated canopy top. The power for the lights and body heater is supplied by the tractor, and at the rear of the trailer is located a pintle and receptacle for attaching another M-19 trailer is necessary. The tractor seats two men and is provided with a curtain enclosure and heater for low temperature operation. The engine is also effectively "winterized" with heavily insulated hood cover and special engine preheater to assist starting.



Special snow tractor, Model M-7, for our armed forces

## New Portable Electric Megaphone

A new, portable electric megaphone which is said to beam the voice directly to the desired area and to project normal speed to long distances has been announced by National Scientific Products Co., 5013 North Kedzie Ave., Chicago 25, Ill. Contractors and civil engineers are stated to have found this instrument of much service in cases where workers were dispersed over a large area. The Merchant Marine uses it for intership communication at sea, and in loading operations at docks. Construction details include a completely waterproof and water-tight megaphone cabinet. Amplifier chassis is shock mounted to the top section of the cabinet permitting easy access to the component parts for ready servicing or replacement. Speakers and microphones contain new molded phenolic diaphragms which are also completely waterproofed. Batteries provide 40 hours of efficient operation and still retain 70% of original voltages. Power is used only during actual voice transmission. Megaphone cabinet is 9½ in. x 4½ in. x 7⅛ in., weighs 11¼ lbs. Speaker is 13¼ in. long, with 7¾ in. diameter bell opening. Complete unit weighs 15 lbs., 5 oz.

New portable electric megaphone

▼

## New Steel-Ribbed Floor for Trailers

A wartime engineering development is a new and patented steel-ribbed floor just announced by the Fruehauf Trailer Co. of Detroit. The new floor is stated to be capable of withstanding a concentrated load of 1,000 lb. per square foot. The steel-ribbed design is a radical departure from the usual "tongue and groove" type. Hardwood floor boards are bolted down between 10 flanged steel ribs, running substantially the full length of the trailer. The flanges of the ribs support the floor boards, and

# READY AND WAITING

This Mack Model FC six-wheeler, with a capacity of 30 tons, is the largest standard truck built. It is especially adapted for use in quarries and strip mines, and for hauling of nickel, copper, iron and other ores.

THE post-war world won't be handed to us ready-made . . . but there will be a ready and waiting market for quarry and mining products. Housing, highways, perhaps new peacetime factories, dams and power-plants will keep supplier and builder busy for years.

Because of their proved ability to haul large tonnage at low cost, heavy duty motor trucks will have a vital part in this work, and far-sighted operators of modern mines are already giving close study to the selection of truck equipment best suited to their particular needs.

Plan *your* future operations now . . . with the advice of our engineers, men who know the job you face, and the kind of truck best fitted to do it. Address your inquiry to Public Works and Mines Division, Mack Trucks, Inc., 350 Fifth Ave., New York 1, New York.

**Mack**

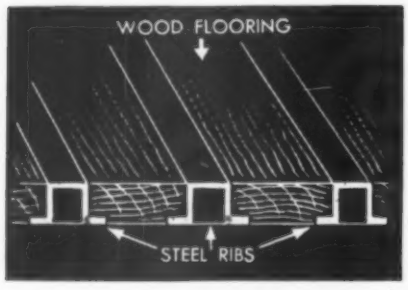
**TRUCKS**
**FOR EVERY PURPOSE**
ONE TON TO FORTY-FIVE TONS

*BUY U. S. WAR BONDS*

*Mack Trucks, Inc., Empire State Bldg., New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N.Y. Factory branches and dealers in all principal cities for service and parts.*

***IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!***

the steel joints are flush with the top of the floor, forming a smooth, long-wearing surface. The high-tensile steel ribs are welded to all chassis cross-members and form an integral part of Fruehauf's airplane-type




End view showing cross section of steel ribbed floor

frame construction. Being stronger than any individual board, the steel ribs not only strengthen the floor but give added strength and rigidity to the chassis by serving as transverse braces to the cross-members. With the new construction, expansion or contraction of boards will not open up cracks in the floor, since each floor board is backed up by metal throughout its entire length. And this weather stripping reinforcement also eliminates "buckling." Besides increased strength and rigidity, the servicing problem is greatly simplified. Any single board can be replaced without disturbing the rest of the floor since there are no "tongues" or "grooves" to worry about, and matched lumber is not required. The new floor is being immediately incorporated by Fruehauf in current production of civilian trailers.

▼

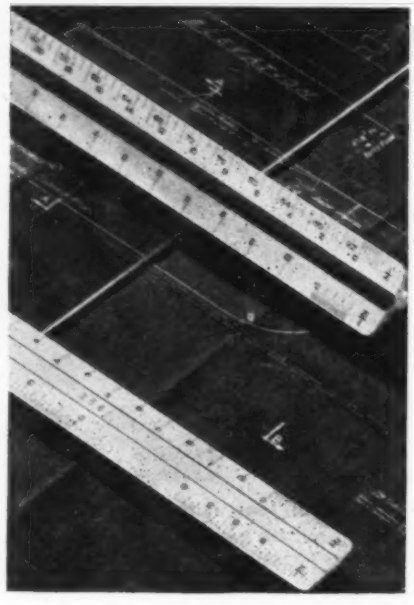
## New Light Weight, High Mobility Car

A new type military vehicle in secret production by the Studebaker Corporation, South Bend, Ind., for nearly two years was announced July 6 for the first time by the Ordnance Department, Army Service Forces. Propelled by a special rubber track, designed and developed in Akron, O., by The B. F. Goodrich Co., the vehicle, known as the "Weasel," is declared capable of operation over a greater variety of terrain conditions than any other now in service including snow, deep mud, swamp land, sand or paved highway. Key to the "Weasel's" ability to roll over surfaces impossible to conventional wheel or other track-laying vehicles, is its light weight combined with broad tracks which extend the full length of a low-slung body. The "Weasel" was designed shortly after the fall of Corregidor when Jap forces were in the Aleutians and a major campaign in the north country seemed probable. Experience in snow operations and other extensive military maneuvers revealed that light weight, ruggedness and high mobility adapted the "Weasel" to a wide range of operations in almost all theatres of war.

▼

## Scales Molded of Plastic

Architects' and engineers' scales are now being injection-molded of Tenite plastic. These all-plastic scales are said to be much more accurate and less likely to warp than scales made of box wood to which strips of cellulose nitrate are cemented. The Tenite scales are white, with easily legible black lines and figures. Stripes in



different colors painted on each side of triangular scales facilitate finding the desired scale. The scales are white, with easily legible black lines and figures. Stripes in different colors painted on each side of triangular scales facilitate finding the desired scale. The scales are molded by American Molding Co., San Francisco, for A. Lietz Co., San Francisco. The Tenite used is a cellulose acetate butyrate product of Tennessee Eastman Corp., Kingsport, Tenn.

▼

## New Bucket Pump Lubricator

The Gray Co., Inc., 60 11th Ave. N. E., Minneapolis, Minn., has announced a new bucket pump called the "Block Buster" for lubricating trucks, contractor's equipment, industrial machinery and farm machinery, it is stated. Pump will han-

Graco "Block Buster"

dle all heavy duty lubricating jobs easily and quickly. It has several unique mechanical features and was designed to withstand hard "on-the-job" servicing. A few of the important features include an easy operating double acting pump developing 4000 lb. pressure; hardened steel, precision ground piston; simple positive foot valve; 18 gauge seam-welded container with ingenious pump support bracket which keeps the pump from being completely removed when filling; and a strong carrying handle which acts on a large stud bolt to hold the cover and pump in position on the container. The conical shaped hopper bottom automatically feeds all the lubricant in the container to the foot valve and prevents channeling and loss of prime.

The Graco "Block Buster" can be obtained with 5½ ft. or 10½ ft. hydraulic adapter-equipped hose assembly, giant buttonhead coupler-equipped hose assembly, or standard buttonhead coupler-equipped hose assembly.

▼

## For Rust Protection

*"Tectyl,"* said to offer positive protection against rust and to be useful in cleaning and conserving machinery parts and metal surfaces, is the name for a series of products now produced by Valvoline Oil Company, 5th and Butler Sts., Cincinnati, Ohio. Representing "Polar" compounds distinguished by a high affinity for metal, the word Tectyl includes a series of products designed for various specific indoor and outdoor uses. One, Tectyl 511, is for use where machinery or metal parts have been immersed in water; direct application removes the water and provides a temporary anti-corrosive covering. Write this company's Cincinnati office for bulletin describing these products and their application in detail.

# With the Manufacturers

## Appoint Mitchell Chief of Mack Truck Research

Appointment of Dr. Walter M. Mitchell as director of research for Mack has been announced by L. C. Josephs, engineering vice president of Mack Trucks, Inc. Dr. Mitchell will direct chemical, metallurgical, electrical, mechanical, Diesel, fuels, lubricants and other research activities allied to the truck firm's products. Before joining the Mack organization, he was chief metallurgist for the New York Safe and Lock Co.'s special ordnance plant producing Bofors anti-aircraft guns for the U. S. Navy. Other positions held by Dr. Mitchell include that of metallurgical engineer with Carnegie Illinois and other U. S. Steel subsidiaries and a similar post with Republic Steel Corp. and its predecessor companies. While he was with E. I. duPont de Nemours & Co. he introduced the use of stainless steel in the construction of plants used for the production of nitric acid, which revolutionized the manufacture of that chemical. He is a graduate of the University of Pennsylvania and received his doctorate from Princeton University.

W. M. Mitchell

▼

## New Buckeye Dealer

The George B. Whitehead Company, 2 Mechanic St., Buffalo, N. Y., has been appointed dealer for the Buckeye Traction Ditcher Company, Findlay, O. They will handle the complete Buckeye line of ditchers, shovels, spreaders and finegraders in more than twenty upstate counties.

▼

## H. R. Murphy Becomes Distributor

Howard R. Murphy, Manager of the Merchandise Department Caterpillar Tractor Co., Peoria, Ill., has resigned to become associated as a principal with W. K. Holt in the "Caterpillar" distributorship in San Antonio and Corpus Christi, Texas. Mr. Murphy joined the "Caterpillar" organization in 1927.

YES, THE WRAPPING ON THAT PACKAGE OF WAR SUPPLIES IS

SISALKRAFT

Normally used for concrete curing and general job protection, SISALKRAFT is now protecting war supplies to invasion areas, to assure their arrival in usable condition. In arctics and tropics, directly exposed to wind, rain, ice, sleet and high humidity, SISALKRAFT is successfully withstanding more abuse than it would get when used a dozen times or more for concrete curing and for protecting materials and equipment stored in the open. The strength and waterproofness you need for concrete curing are the qualities which enable SISALKRAFT to do such an outstanding war job.

**Put SISALKRAFT First in Your Postwar Plans — *for dependable concrete curing!***

The prewar building photo here reproduced was taken after the SISALKRAFT had been subjected to a 60 m.p.h. gale for 24 hours. Every square foot of SISALKRAFT was unharmed and in place after this terrific test!

Used for curing concrete roads, runways and floors SISALKRAFT also protects newly poured concrete from frost. SISALKRAFT Blankets have an amazingly long life. Used again and again for concrete curing, "old" SISALKRAFT Blankets afford effective protection for subgrade and materials. When Victory is won SISALKRAFT will again be available. Put this scuff-proof, weather-resistant low cost material *first* on your list for postwar use! It has a 25 year record of satisfactory service!

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

*Manufacturers of* SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

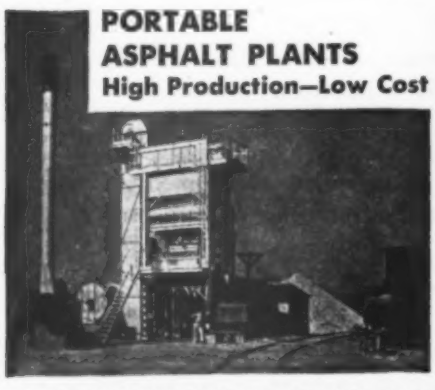
# *Twenty-two* REASONS
## Why *FLEX-PLANE* Dummy Joints are Necessary in Modern Concrete Pavements

- Reduces the Number of Expansion Joints
- More Dummy Joints Divide Contraction Openings
- Prevents Cracking
- Retards Creeping
- Controls Warping
- Reduces Curling
- Relieves Stress
- Lessens Bumps
- Minimizes Pumping
- Minimizes Panning
- Lessens Deterioration
- Lowest Cost
- Limits Maintenance Cost
- Anchored in Place—Is Permanent
- No Extrusion
- Localizes Expansion and Contraction
- Assists in Normalizing the Slabs
- Ribbon Joint is Continuous in Length
- Prevents Infiltration of Water
- Increases Strength of Slabs
- Produces Homogenous Structure
- Provides Expansion Relief for the Hot Upper Part of the Slab

*FLEX-PLANE joint installing machines eliminate messy hand methods. Install all types of joints . . . ribbon, poured, premoulded, etc., with or without VIBRATION.*

• *Ask for Equipment Specifications* •

FLEXIBLE ROAD JOINT MACHINE CO. WARREN, OHIO U S A



PORTABLE
ASPHALT PLANTS
High Production—Low Cost

THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

South Bend
GUTTER-SNIPE
PICK-UP STREET SWEEPERS

•

STREET FLUSHERS
STREET SPRINKLERS
BITUMINOUS DISTRIBUTORS
BITUMINOUS MAINTENANCE UNITS

•

*Since 1908*

MUNICIPAL SUPPLY COMPANY - SOUTH BEND 23, INDIANA


## Promotions by Cleveland Pneumatic

Officials of the Cleveland Pneumatic Tool Co., Cleveland, O., have announced the promotion of two veteran employes to top-ranking production posts. A. B. Johnson, who has been with the tool concern 28 years, has been named plant manager and will have complete responsibility for all manufacturing facilities. He has served in many capacities, at one time as plant superintendent, and more

A. B. Johnson

C. W. Wallin

recently as master mechanic. Prior to joining Cleveland Pneumatic as assistant superintendent, he had been with Shaw Pneumatic Tool Co., and the Denver Rock Drill Co. Conrad W. Wallin, who came to Cleveland Pneumatic in 1940 to assist the planning of plant expansion, has been appointed plant manager of Cleveland Pneumatic Aerol, Inc., a wholly-owned subsidiary of Cleveland Pneumatic, said to be the largest plant in the world devoted to the straight line production of landing gear aerols. As a trade machinist Mr. Wallin joined the Northway Motor Co. in 1913. From 1916 he became a specialist in production planning, and in that capacity served successively with the Ferro Machine and Foundry Co., and the Cleveland Tractor Co., becoming assistant works manager of the latter before affiliating with Cleveland Pneumatic.

▼

## Gar Wood's Engineering Departments Centralized

Glen A. Bassett, president of Gar Wood Industries, Inc., has announced the centralization of the company's engineering departments and described the move as another step in its overall program aimed at both improving even further its output of war goods and also at easing the transition to peacetime operations. Now scattered in four locations, the engineers of the hoist and body, winch and crane, tank, and road machinery divisions have been brought together in the company's main plant and will be adjacent to the executive offices. Mr. Bassett had previously announced a revamping of the production set-up.

## George J. Dimond Now Sales Manager of Insley Corporation

Appointment of George J. Dimond as sales manager of the Insley Manufacturing Corporation, Indianapolis, Ind., has been announced by William B. Elliott, President. Mr. Dimond succeeds Ray W. Dorward, who has retired. The new sales manager has long been a prominent figure in the construction equipment industry. Twenty-five years ago he joined The Koehring Co. of Milwaukee, Wis., as field service representative, rising through a steady succession of promotions to the post of sales manager which position he held at the time of his resignation on May 31 to join Insley. Prior to his affiliation with the former company, he was engaged in the construction industry. Throughout the quarter-century he has devoted to construction equipment sales and service, Mr. Dimond has taken an active part in numerous nationally-known organizations of equipment manufacturers, dealers and contractors. He has been a member of the American Road Builders Association ever since its founding and, for the last five years, a director of that association's Manufacturers Division. He was also active in the affairs of the American General Contractors Association's Mixer Manufacturers Bureau and for the past two years served as chairman of the bureau.

G. J. Dimond

▼

## Lloyd Reid Joins International Salt Co.

Lloyd B. Reid, Traffic Engineer of Detroit and one of the country's outstanding authorities on highway engineering, has joined International Salt Co., Inc., as a consulting engineer. Mr. Reid was formerly Michigan State Highway Commissioner and is widely known as an expert on matters pertaining to highway management among both federal and state officials. In his new post Mr. Reid will assist in an aggressive campaign to promote the use of rock salt for snow and ice control on streets and highways.

L. B. Reid


TROJAN

UTILITY PATROL

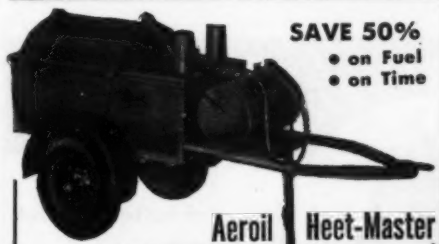
*Saves Time and Money*

**You'll choose the TROJAN if you investigate the work done by the 40 brake h. p. and 10,000 lbs. weight in this modern design patrol. Compare its results with heavier, slower and more expensive equipment.**

**CONTRACTORS MACHINERY COMPANY, INC.**
**Dept. RS-84, BATAVIA, N. Y.**
*Represented by The International Harvester Industrial Dealer in Your Community*

**One of 5 TROJANS recently delivered to the State of Virginia Highway Department.**

**TROJAN ROAD TOOLS INCLUDE: PATROLS, SELF-POWERED SPEED TAMPERS, DRAWN TAMPING ROLLERS, SCRAPERS**



**SAVE 50%**
• on Fuel
• on Time

**Aeroil Heet-Master**
**HEATS AND MELTS ASPHALT TWICE AS FAST**

The ONLY insulated tube fired kettle with a completely removable heating unit (for quick and easy cleaning). The ONLY kettle with the burner INSIDE. Now available on pneumatics (and with mud guards too at slight extra cost) on high priority orders. Send for FREE Bulletin No. 260HR. For paving tools and accessories write for Leaflet No. 501RS.

**AEROIL BURNER CO., INC.**
WEST NEW YORK, N. J.
Chicago San Francisco Dallas

VULCAN

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

**ARE MADE in a complete line of sizes to fit all standard compressed air hammers.**

***Send for NEW Vulcan illustrated CATALOG today.***

VULCAN TOOL MFG. CO.
QUINCY, MASS.

BITUVIA Road Tar

KEEPS THE ROADS UP and the Costs DOWN!

Send for copy of this pocket-size Bituvia Manual

● BITUVIA Road Tar gives old neglected roads a new skid resistant surface that means many extra years service. BITUVIA saves time and money because its application requires a minimum of equipment and man hours per mile. A Reilly engineer will be glad to show you how BITUVIA Road Tar may be economically used in your maintenance and repair work, as well as on new construction.

REILLY TAR & CHEMICAL CORPORATION
Executive Offices: Merchants Bank Building, Indianapolis, Indiana
2513 S. DAMEN AVENUE, CHICAGO, ILLINOIS 500 FIFTH AVENUE, NEW YORK, N. Y. ST. LOUIS PARK, MINNEAPOLIS, MINN.
SEVENTEEN · PLANTS · TO · SERVE · YOU

ERIE THE COMPLETE LINE BUCKETS

Hundreds of Erie Buckets are being shipped monthly for war uses. Straight line bucket production experience means better buckets for post-war and fast delivery. Investigate the complete Erie line now.

ERIE STEEL CONSTRUCTION CO · ERIE, PA.
AggreMeters · Buckets · Concrete Plants · Traveling Cranes

## Personnel Changes at Raybestos

Personnel changes made as part of a general postwar plan to fortify the sales structure of The Raybestos Division, Bridgeport, Conn., have been announced by Robert B. Davis, General Manager. Norman Leeds, Jr., formerly replacement sales manager, becomes general sales manager; Sidney E. Shepard, previously sales promotion and advertising manager, is now director of replacement sales, and James L. McGovern, Jr., who was eastern zone manager, becomes supervisor of replacement field sales. Other appointments include those of Jerome W. Brush, Jr., as manager of the rubber products department; A. A. Woodruff, Jr., as manager of the industrial products department; Frank Crook as manager of transportation sales, and C. T. Begg as director of service sales.

Left to right: James L. McGovern, Jr., Norman Leeds, Jr., and Sidney E. Shepard

## Named Export Sales Manager for Iowa Mfg. Co.

Frank P. D. Aquila, well known lecturer-author on Latin American relations, has been appointed export sales manager of the Iowa Manufacturing Co., Cedar Rapids, Ia.

## L. C. Allenbrand Promoted

L. C. Allenbrand

L. C. Allenbrand has been appointed manager of the Merchandise Department of Caterpillar Tractor Co., of Peoria, Ill. He succeeds H. R. Murphy who left the company July 31 to become associated with the Caterpillar distributorship in San Antonio, Tex. Mr. Allenbrand was graduated from the University of Missouri in 1923. For the next 8 years he was with the John Deere Plow Co., Kansas City, Mo. He came to the Caterpillar Tractor Co. in 1931. In January, 1944, he was made assistant director of the Industrial Relations Department, the position he held to the present.

## C. G. A. Schmidt Appointed Sales Manager of Riddell

Carl G. A. Schmidt has been appointed sales manager of the W. A. Riddel Corporation and the Hercules Roller Co., Bucyrus, O. He will be in charge of sales of the Warco line of construction machinery and the Hercules rollers. Mr. Schmidt came to Riddell directly from The Hercules Co. of Marion, O., where he was manager of sales. Previous to his connection with The Hercules Co. he was equipment engineer with the Pennsylvania Department of Highways. During his many years in the construction equipment field in sales and engineering, he has become well and favorably known to the trade. Mr. Schmidt is a graduate Mechanical Engineer. E. M. Ackerman has been appointed as assistant sales manager in the road machinery department of the W. A. Riddell Corporation. Mr. Ackerman, through his long years of experience with road construction equipment, both in the field and in the service department, has a knowledge of all phases of the business and is well known to equipment dealers and contractors. He has been associated with the Riddell Corporation for the past sixteen years.

▼

## Two New Directors for Fruehauf

Harvey C. Fruehauf, president of the Fruehauf Trailer Co., has announced that Robert S. Kirksey, vice-president in charge of Pacific Coast Operations, and F. Malcolm Reid, vice-president in charge of Engineering, have been elected to the Board of Directors.

▼

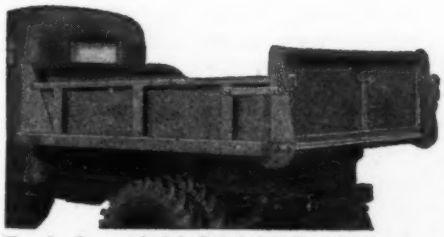
## New P&H Distributor for North Carolina

The Harnischfeger Corp., Milwaukee, Wis., has appointed J. B. Hunt & Sons, Raleigh, N. C., as distributors of P&H Excavators for the entire state of North Carolina. The Hunt organization will handle all sizes of machines up to 1½ cu. yds. capacity, including crawler cranes and truck cranes. Headquarters of the new agency, with complete sales and service facilities, are located at 323 West Martin St., in Raleigh. The new distributor also represents the non-competitive lines of J. D. Adams Co., Hercules Steel Products, Schram, Inc. Compressors, Diamond Iron Works, Buda Engines, and W. E. Grace Manufacturing Co.

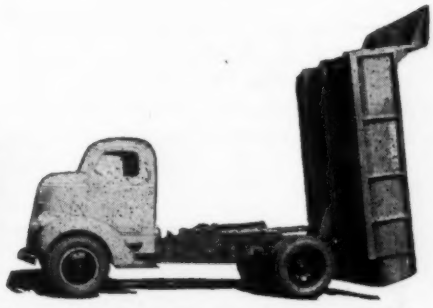

# HERCULES

## HYDRAULIC HOISTS and DUMP BODIES

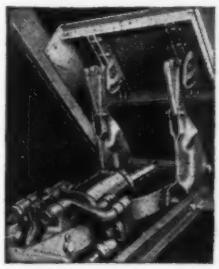
GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS



*Hercules Removable Side Rub Rail Body with hinged rear corner posts. Available in many sizes.*



*Hercules High Dumper—Power up, power down with 78° dumping angle. Equipped with 12 ton capacity hoist.*



### HERCULES HYDRAULIC BOOSTER HOIST

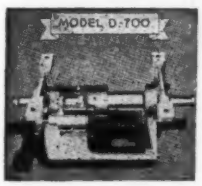
**Makes any truck a Dump Truck**

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6" cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

### USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

**To operate any truck-mounted equipment**




Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.

## HERCULES STEEL PRODUCTS CO.

GALION, OHIO

## ASPHALT

for all purposes

Prompt Shipments Ample Facilities

Inquiries Solicited

**Talco Asphalt & Refining Division of Southport Petroleum Company**

New York 17, N. Y. Dallas, Texas
155 East 44th Street Magnolia Bldg.
Telephone—Murray Hill 2-2088

## RELIANCE

**CRUSHING, SCREENING and WASHING UNITS**

● Up to 2000 Tons a Day ●

Crushers
Elevators
Screens
Wash Boxes
Bins
Pulverizers
Feeders
Spreaders
Kettles
Conveyors
Drag-Lines "GAYCO"
Centrifugal Air Separators

UNIVERSAL ROAD MACHINERY CO.
Kingston, N. Y.

Canadian Representatives: F. H. Hopkins & Co., Ltd
340 Canada Cement Co., Montreal, Que., Can

# CORONACH

*"Of those immortal dead who live again*
*In minds made better by their presence."*

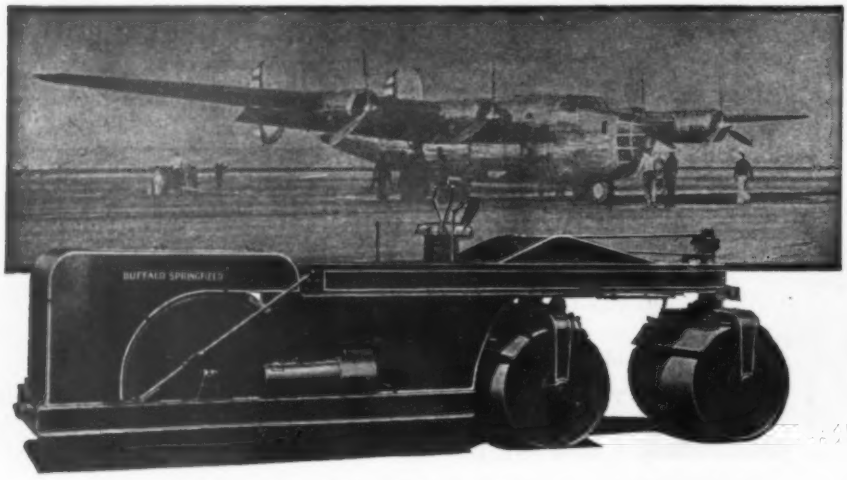
AUGUST A. BODIN, head of A. A. Bodin & Sons, Duluth, Minn., died July 14, aged 82. He had been engaged in contracting for over 45 years, mostly in municipal paving and similar work.

JOHN V. MCGOVERN, member of John F. McGovern & Son, contractors, New Brunswick, N. J., died July 24. He was 52.

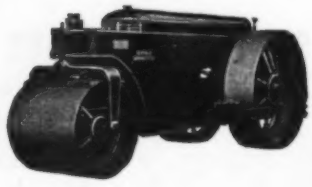
WILLIAM J. TORRINGTON, superintendent of construction for George Vang, Inc., Cumberland, Md., died July 17. He was 65. At the time of his death he was in charge of work on the Baltimore & Ohio R.R. right of way from Cumberland to Fairhope, Pa. As superintendent for the E. P. H. Harrison Construction Co., Martinsburg, W. Va., he built several highways on the south branch valley of the Potomac River.

MORIZ BERNSTEIN, for more than 20 years assistant engineer of the Bureau of Highways and Street Cleaning of Philadelphia, Pa., before his retirement 6 years ago, died July 12. He was 68 years old. He was graduated from Lehigh University in 1896. He was chief engineer in the construction of the Walnut Lane bridge in Fairmount Park, Philadelphia.

JOHN V. W. REYNDERS, consulting engineer, New York City, died last month at the age of 76. He was graduated from Rensselaer Polytechnic Institute in 1888. In 1890 he went to work for the Pennsylvania Steel Co. at Steelton, Pa., remaining with that company until 1916. When he began his career with that company he was commissioned to inaugurate the bridge-building facilities and in 1906 was placed in charge of the entire plant as vice president and general manager. In 1916 he came to New York and established a consulting engineering practice. He was receiver for the Central Iron & Steel Co. in Harrisburg from 1912 to 1917 and president of the American Tube & Stamping Co. from 1917 to 1919. A large steel-making project was completed recently in East Texas for the United States Government under his supervision.

VICTORY *in* 1944?



With American made construction machinery leveling mountainside and jungle ahead of our bombers and those bombers leveling the enemy at every contact, victory will, in due course, be ours.

The Buffalo-Springfield organization is proud of the contribution its product is making in the service of our country.

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

BUFFALO-SPRINGFIELD ROLLERS

POWER HYDRAULIC CONTROL

The Burch Drawn Type Road Maintainer is power hydraulic controlled and thus is adapted to many different jobs. It is an up-to-the-minute machine for road and shoulder maintenance and for resurfacing work.

See your nearest distributor or write for Bulletin X 6.

Manufactured by
The Burch Corporation
CRESTLINE, OHIO

BUY BONDS

## New Trade Literature

AUTOMATIC LUBRICATION — A 4-page circular issued by Rucker Equipment Co., 300 17th St. Oakland 12, Calif., illustrates and describes the Arnold lubricator, used to furnish a mixture of oiled air to pneumatic tools, such as rock drills, air hoists, etc., etc.

▼

DUST COLLECTOR—The Markley-Carter dust collector, a portable unit for use in rock drilling in general excavation, tunnels, mines and quarries, is illustrated and described in a 4-page circular issued by Ralph B. Carter Co., 192 Atlantic St., Hackensack, N. J.

▼

ROLLERS— A new series of folders describing wobble wheel, tamping, and all steel rollers have been printed by the Wm. Bros Boiler & Manufacturing Co., Minneapolis, Minn. Specific application of highway and airport rollers is fully detailed in the three brochures. Descriptions, color illustrations and engineering specifications are given.

▼

CENTRALIZED LUBRICATION—How centralized lubrication systems increase the production out-put of machinery and at the same time make impressive savings in time, power and lubricating materials, is the theme of Bulletin No. 25, newly published by The Farval Corporation, Cleveland, O.

▼

PORTABLE CEMENT PLANTS—Two new bulletins describing portable cement plants have been issued by C. S. Johnson Co., Champaign, Ill.

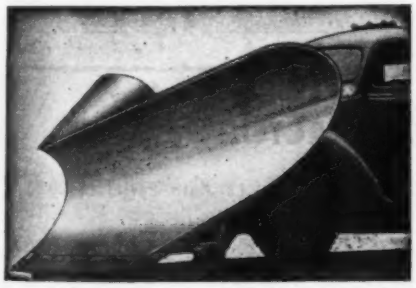
▼

PORTABLE COMPRESSORS — A bulletin covering its general line of portable compressors, issued by Schramm, Inc., West Chester, Pa., illustrates the various types of mountings and sizes of outfits. The bulletin also illustrates some of the applications of compressed air construction work.

▲

OIL DILUTION EXTRACTOR—The Oildex oil dilution extractor, designed to remove diluent vapors from the crankcase before they condense into damaging liquid impurities, is described in a 4-page circular issued by Motor Economy Products, Inc., 407 W. 36th St., New York 18, N. Y. Oildex extracts, then filters these vapors and returns them through the volumetric control valve to the cylinders where they are utilized as reclaimed fuel.


**LICK YOUR SNOW REMOVAL PROBLEMS WITH THE ROOT PLOW**



Root Plows clean a snow and ice packed road right down to the surface, enabling truck or tractor to get complete traction and avoid loss of power. Root Plows give you a cleaner job, do the job faster and their sturdy construction and shock absorbing features lengthen the life of your power unit, truck or tractor. The reversible blades for use on either side of plow, doubling the utility of your blades, are an exclusive Root feature. Before you buy a snow plow investigate the Root plow unit.

**ROOT SPRING SCRAPER CO.**
Kalamazoo, Michigan
*Builders of road maintenance equipment since 1890*

AN *Economical*

**PORTABLE MIXING PLANT**

*for Low Cost*
**BITUMINOUS MIXTURES**

**400 to 8000 LB. CAPACITIES**

**OUTPUT CAPACITY *Up To* 250 Tons Per Hour**

H & B — ESTABLISHED 1867

● While this H & B Model C Plant is designed primarily for cold mix, it is possible and practical to make later addition of dryers, screens and other equipment which may be required by changed specifications or conditions. Simple design, with a minimum of working parts and sturdy construction throughout, makes possible a low first cost and insures long life, low maintenance and rock bottom cost per ton of mixed material. Batch weighing of both aggregate and asphalt is standard, but these plants may also be equipped with our Fluidometer System for automatic operation. . . . Knockdown construction with removable bin, makes possible easy moving by truck or trailer. Operates with gasoline, Diesel, steam or electric power.

**New Bulletin C-44, gives comlete information and specifications. Write for it.**

**HETHERINGTON & BERNER INC.**
*America's First Builders of Asphalt Mixing Plants*
**701-45 KENTUCKY AVENUE, INDIANAPOLIS 7, INDIANA**

# Clearing House

## TRANSITS and LEVELS

***New or Rebuilt***
***Sale or Rent***

**Headquarters for REPAIRS — any make. Factory Service. We will also *buy* your old instruments or take them in *trade*.**

**A complete line of Engineering Instruments and Equipment for Field or Office. Write for Bulletin RS-98.**

**WARREN-KNIGHT CO.**
***Manufacturers of Sterling Transits and Levels***
**136 N. 12th St. Philadelphia 7, Penna.**

## FOR SALE OR RENT

1—Bucyrus-Erie Model D2 Diesel Driven one cu. yd. Combination Shovel—Crane and dragline complete with 1 cu. yd. dipper bucket and 1 cu. yd. Page dragline bucket.

1—B2 Erie Steam Crane with 45 HP heavy duty boiler—40 ft. boom.

**MAHONEY-CLARKE, INC.**
**217 Pearl Street New York 7, N. Y.**

## FOR SALE:

1—P&H Crane, Model 200, Shop No. 1865 with ⅝ yard bucket, $3,500.00.

1—Huber 10-ton, 3-wheel Roller, Shop No. 29690—$2,000.00.

**Box 152, Roads and Streets, 330 So. Wells St., Chicago 6, Ill.**

## EQUIPMENT WANTED

1—Distributor mounted on good Truck.

**Box 153, Roads and Streets, 330 So. Wells St., Chicago 6, Ill.**

## ASPHALT PLANTS

2 Ton Cummer Stationary.
1½ Ton Cedar Rapids Portable Diesel.
2—1000 lbs. Cummer Portable.
3—2500 and 10,500 bbl. Oil Tanks.

L. M. STANHOPE
304 Conestoga Road, Wayne, Penna.

## LIQUIDATION SALE

Liquidating Red Granite Quarry at Lohrville, Wisconsin; 5 Guy Derricks, 3 Gyratory crushers, 1 Symons horizontal disc crushers, 2 electric hoists, grout cars, and numerous other items; 2—75 HP motors, 1 Allis-Chalmers revolving screen, 1—11,000 gallon oil tank; rail, pipe & air receivers; complete inventory on request.

Write
KLATZKY BROTHERS
Calumet, Michigan

## FOR SALE

1—Complete Crushing Plant, capacity 50 to 75 tons per hour, consisting of the following: 36 in. roll. 4x6 triple deck screen, 165-ton Blaw-Knox bin. 30-ft. conveyor, portable pan feeder. 85-ft. elevator. Complete with all electric motors, starters, and accessories. Priced to sell quick.

**Asphaltic Limestone Sales Co.**
**Robert Totterdale**
**65 E. State St. Columbus, Ohio**
**Phones: Adams 2676 or University 6307**

## Help Wanted

Progressive industrial concern wants sales engineer for Eastern seaboard, with knowledge of highway accessories sales and service. Knowledge of traffic control helpful. Age 30-38; salary open. Excellent future. Address full particulars to Box 153, Roads and Streets, 330 So. Wells St., Chicago 6, Ill.

## TIRE REPAIRS

**In all sizes of tractor, truck, wheelbarrow, passenger or 1800x24 tires.**
**An Equa-Flex "Sectional" repair constructed in your tire is guaranteed. Best results and prompt service!**
**It is a fact that we do repair run flat tires, passenger and truck, without a reliner!**

**WALLACE TIRE SERVICE, Inc.**
**2320 S. Michigan Ave. Chicago, Ill.**

## SURPLUS EQUIPMENT FOR SALE BY CONTRACTOR

3 KOEHRING WHEELERS, Model WHC8, Serial Nos. 1036, 37, 38. Equipped with General Motors Diesel engines.

1 RD8 TRACTOR, Serial No. 1H950, equipped with two drum power control unit and bulldozer.
For Sale as a Unit.....$24,000.00

1 "75" CATERPILLAR DIESEL TRACTOR, Serial No. 2E641. Equipped with Bulldozer.

1 CATERPILLAR 48" ELEVATING GRADER, Serial No. 4E117.
For Sale as a Unit.....$10,000.00

1 10S REX CONCRETE MIXER, Serial No. 126634.....$980.00

1 PAVING OUTFIT, consisting off:
1 REX 27E PAVER, Serial No. 9530
1 LAKEWOOD 20' CONCRETE FINISHING MACHINE
1 LAKEWOOD 20' SUBGRADER
1,200 Mt. of 7" Steel Forms
2,000 Ft. of 9' Steel Forms
For Sale as a Unit.....$6,500.00

1KOHLER 3KW LIGHT PLANT, used 60 days.....$400.00

1 BULLDOZER ATTACHMENT for No. 12 Auto Patrol..$400.00

1 "60" CATERPILLAR TRACTOR, equipped with Bulldozer .....$1,000.00

4 DOUBLE DRUM SHEEPFOOT ROLLERS.....Each $500.00

1 2,000 GALLON SEMI-TRAILER TANK.....$500.00

1 2,400 GALLON SEMI-TRAILER TANK .....$700.00

1 MODEL "C" ALLIS CHALMERS FARM TRACTOR including plow attachment.....$600.00

1 MODEL "A" ALLIS CHALMERS FARM TRACTOR, including plow attachment.....$975.00

1 MODEL "F" DETOURNEAU CARRYALL.....$4,500.00

1 "STANDARD" 4,000 POUND ASPHALT PLANT. Complete with dryer, boiler, dust collector, four 8,000 gal, storage tanks, Caterpillar D—17,000 power unit, and Jaeger's laydown machine. This plant has processed only about 60,000 tons of material .....$40,000.00

All of these units have been reconditioned and are ready to go to work. Prices are F.O.B. present location and offer is subject to prior sale. Most of these units are located at 3525 North Fourth Street, Albuquerque, New Mexico; P. O. Box 1479 or telephone 9696.

## Books and Pamphlets Received

"FUNDAMENTALS OF INDETERMINATE STRUCTURES," by Fred L. Plummer, Pitman Publishing Co., New York and Chicago. 232 pp., $4. This compact, thoroughly understandable book, presents all the principal basic and special analysis methods now in general use. Long formulas and theoretical derivations are avoided wherever possible. Each problem is clearly and profusely illustrated with practical examples. Methods presented are modified so that accompanying tables of constants for members of variable cross section may be directly to them. The author is chief research engineer for the Hammond Iron Works. He holds engineering degrees from Ohio University and the Case School of Applied Science. He taught civil and structural engineering in the latter institution for 14 years. He has had an extended experience in consulting work.

▼

RENEGOTIATIONS REGULATIONS—The War Price Contracts and Adjustment Board has issued a loose leaf manual on renegotiations. The manual consists of 275 pp. and will be supplemented from time to time as the regulations are themselves supplemented. It is available at the subscription price of $2.00 which includes 12 monthly supplements and can be obtained directly from the Superintendent of Documents, Washington, D. C.

▼

2ND INTERIM REPORT 1944, NEW YORK POSTWAR PUBLIC WORKS PLANNING COMMISSION. In its 80 pages this report reviews the state's $990,000,000 potential postwar public works, with chapters on highways, parkways, thruways, grade crossing eliminations in principle cities, and grade crossing reconstruction.

▼

17TH ANNUAL HIGHWAY CONFERENCE OF THE UNIVERSITY OF COLORADO, (Jan. 8, 1944). Published by the University at Boulder; address inquiries for copies to Roderick L. Downing, professor of civil engineering. Includes valuable papers on limited access highways, legislation and land acquisition, operation an dsafety, off-street parking, the Denver plan.

▼

CONTRACT TERMINATIONS — The War Department has issued a pamphlet entitled "Contractors Guide" (War Department Pamphlet No. 34-2), the purpose of which is to assist the contractor to do his part in bringing about the fast, fair and final settlement of his contract. It contains the "ABC" of termination from the contractor's point of view, and suggests various steps that the contractor may take to aid in bringing about an early and equitable settlement. Copies may be obtained by writing the War Department, Washington 25, D. C.

HOW Important Are
WHEELS and AXLES
No matter how good you make your Portable Units, the user will not enjoy its ultimate satisfaction unless he can handle it speedily — efficiently — and with complete confidence.
That means that Wheels — good Wheels — are a vital part of your assembly. Let our Engineers show you how to make the most of the good Wheels we can produce for you. Write today for complete Illustrated Bulletins, covering wheels of every type — for every need.
EWC WHEELS
Electric Wheel Co., Dept. RS Quincy, Ill.

NATIONAL GUNITE
Pressure-Packed
CONCRETE
*has superior advantages:*

Low water ratio assures density at all points—no voids, no bubbles or air pockets . . . Waterproof —perfect steel protection. . . . Greater strength with less thickness . . . No waste of material . . . Great savings in time.

Recommended for rebuilding or relining disintegrated concrete and steel as well as new work.

National Gunite is a coast-to-coast engineering organization with years of experience, supplemented by field crews of skilled Gunite operators.

*Write, giving your requirements*

NATIONAL GUNITE CORPORATION
420 Lexington Ave., New York 17, N. Y.
Boston Washington

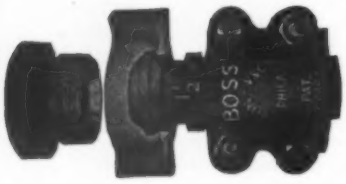
To Keep Abreast of Official Highway Progress

You are invited to subscribe to "American Highways," the official publication of the American Association of State Highway Officials. Published quarterly, this periodical reports the meetings and the transactions of the organization. **$1.00** for yearly subscription in the United States; **$1.50** for yearly subscription in foreign countries; or **$.50** per copy.

You should keep informed on the workings of this organization to keep abreast of highway progress.

**AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS**
1218 National Press Building
Washington, D. C.

# DIXON *Quality* Couplings Mean Safe, Efficient, Low Cost Service




## "G J-BOSS"

GROUND JOINT STYLE X-34

FEMALE HOSE COUPLING

The most efficient female type coupling for high or low pressure steam, air or liquid hose. Exceptionally strong and durable. Correctly designed "BOSS" Offset Interlocking Clamp anchors coupling to hose with powerful, full-circumference grip—no possibility of straight-line leaks or blow-offs. Ground joint construction eliminates replacement of leaking or lost washers. Sizes ½" to 4", inclusive.

## "BOSS"

WASHER TYPE STYLE W-16

FEMALE HOSE COUPLING

Same as "G J-BOSS" coupling, described above, except that seal between stem and spud is provided by washer, instead of ground joint union. More widely used than any other industrail hose coupling. Sizes ¼" to 4", inclusive.

## "BOSS" MALE COUPLING

STYLE MX-16

Companion coupling to both the "G J-BOSS" and "BOSS" female couplings, described above. Patented "Cor-o-Zig" stem; strong hex portion; efficient "BOSS" Offset Interlocking Clamp. More convenient and economical than regular iron pipe nipples, as each size fits same size straight end hose. Sizes ¼" to 4", inclusive.

## "G J-BOSS" and "BOSS" AIR HAMMER COUPLINGS

Ground Joint and Washer Style Couplings, in compact and heavy types, for use on all kinds of pneumatic tools. Efficient "BOSS" Interlocking Clamp assures the widest margin of safety against blow-offs.

## "KING" SHANK COUPLINGS

Strong, carefully made malleable iron couplings for suction and water hose. Uniform in quality, threading and dimensions. Heavy Pattern (illustrated), sizes 3" to 8", inclusive; Regular Pattern, with pin lugs on female only, sizes 1½" to 3", inclusive.

**Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.**

**DIXON**
VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA, PA.
BRANCHES: CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON


# *Index to Advertisers*


**A**

*Adams Company, J. D.....Second Cover
*Aeroil Burner Co., Inc.....105
Allis-Chalmers Tractor Division..... 19
American Association of State Highway Officials .....111
American Cable Division....Third Cover
American Chain & Cable Co., Inc., .....Third Cover
*Austin Western Co.....4-5
Auto Gear & Parts Co..... 90

**B**

*Baker Mfg. Co., The .....2-29
*Barber Greene Co. ..... 46
Barnes Mfg. Co. ..... 50
Barrett Co. ..... 99
*Bethlehem Steel Company..... 1
Briggs Clarifier Co..... 51
Briggs & Stratton..... 78
*Bros Boiler & Mfg. Co., Wm..... 74
*Buckeye Traction Ditcher Co.....17-72
Bucyrus-Erie Co. .....20-21
*Buffalo Springfield Roller Co.....108
*Burch Corp. .....108
Byers Machine Co., The ..... 51

**C**

*Cleveland Tractor Co., The..... 76
*Contractors Machy. Co., Inc.....105
Connery Construction Co. ..... 2
Cummins Engine Co..... 55

**D**

Dixon Valve & Coup. Co.....112

**E**

Electric Wheel Co.....111
*Erie Steel Constr. Co.....106

**F**

Fawick Airflex Co., Inc..... 43
*Flexible Road Joint Machine Co.....104
Flink Co., The..... 54
Foote Company, Inc., The..... 30
*Four Wheel Drive Auto Co..... 49
Fruehauf Trailer Co..... 28

**G**

*Galion Iron Works & Mfg. Co., The.. 15
*Gar Wood Industries..... 6
*General Excavator Co..... 24
Goodyear Tire & Rubber Co. ..... 58
Gorman-Rupp Co., The ..... 51
*Gruendler Crusher & Pulverizer Co... 54

**H**

*Hanson Clutch & Mach. Co..... 48
Hazard Wire Rope Division.....12-13
*Heil Co. .....87-91
*Heltzel Steel Form & Iron Co..... 47
Hercules Steel Products Co.....107
Hetherington & Berner, Inc.....109
Huber Mfg. Co., The..... 41

**I**

Independent Pneumatic Tool Co..... 10
*Insley Mfg. Co..... 56
*International Harvester Co..... 33
*Iowa Mfg. Co..... 25

**J**

*Jaeger Machine Co., The..... 7

**K**

Keystone Asphalt Products Co..... 32
Koehring Company ..... 39
Koppers Co. ..... 23

**L**

*La Plant-Choate Mfg. Co..... 35
*Link-Belt Speeder Corp..... 45
*Littleford Bros. ..... 14

**M**

M-R-S Mfg. Co..... 57
Mack Trucks, Inc.....101
*MacMillan Petroleum Corp..... 26
Marion Steam Shovel Co., The..... 53
*Marmon-Herrington Company, Inc... 37
McCarter Iron Works, Inc.....104
*Michigan Power Shovel Co..... 42
Municipal Supply Co.....104

**N**

National Gunite Corp. .....111

**O**

*Osgood Co. ..... 24
*Owen Bucket Co., The..... 52

**P**

Perfection Steel Body Co..... 50
*Pioneer Engineering Works..... 52
Portland Cement Ass'n..... 16
Preformed Wire Rope ..... 38

**R**

Raybestos-Manhattan, Inc..... 96
Reilly Tar & Chemical Corp.....106
Richkraft Co., The ..... 8
Rogers Brothers Corporation..... 52
Root Spring Scraper Co.....109

**S**

*Sauerman Bros., Inc..... 56
Schramm, Inc. ..... 9
Shunk Mfg. Co..... 56
Sinclair Refining Co..... 18
Sisalkraft Co. .....103
Standard Oil, Calif..... 95
Standard Oil (Indiana) ..... 54
Standard Steel Corp..... 31
Stoody Co. ..... 27
Stulz-Sickles Co. ..... 94

**T**

Talco Asphalt & Refining.....107
*Texas Co., The.....Back Cover
Thew Shovel Co., The..... 3
Thornton Tandem Co..... 83
*Timken Roller Bearing Co..Front Cover
Truscon Steel Co..... 44
Tuthill Spring Co..... 52

**U**

Universal Atlas Cement Co..... 40
*Universal Engr. Corp..... 22
Universal Road Machinery Co.....107
Universal Unit Machy. Corp. ..... 54

**V**

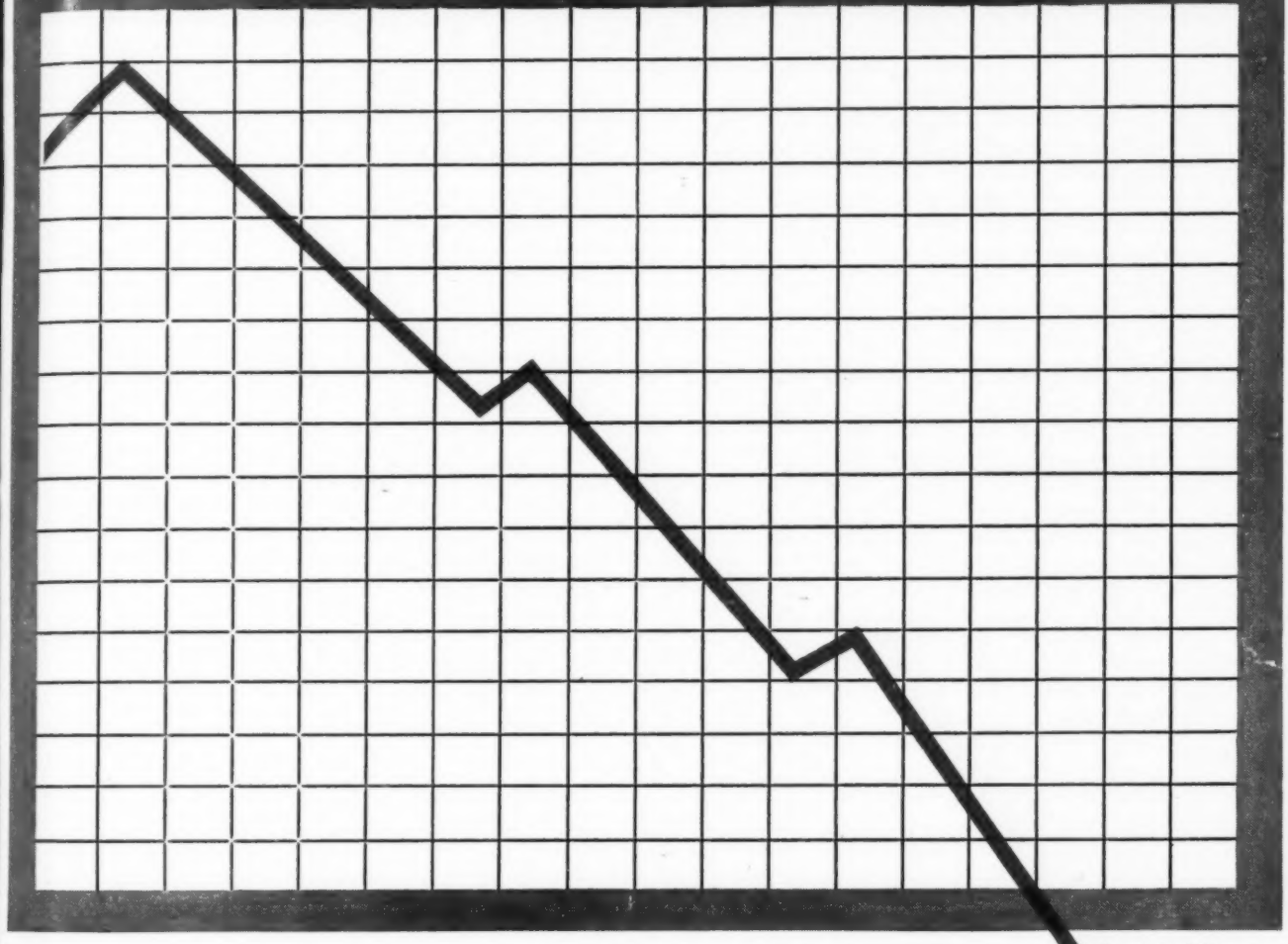
Van der Horst Corp. of Amer..... 81
Vickers, Inc. ..... 84
Vulcan Tool Mfg. Co.....105

**W**

Wallace Tire Service, Inc.....110
Walter Motor Truck Co..... 34
Ward, La France Truck Division.... 36
(Great American Industries, Inc.)
Warren-Knight Co. .....110
*Wellman Engineering Co., The..... 48
Wellman Co., S. K., The..... 11
White Mfg. Co. ..... 54


*Advertisers with * are represented in the 1944 edition of Powers' Road and Street Catalog and Data Book. Please refer to it for additional information on any of their products.

# WORKMAN ACCIDENT RECORD



## JOE MUST HAVE SWITCHED TO TRU-LAY PREFORMED WIRE ROPE!!

**(Yes — it's safer to handle)**

**AMERICAN CABLE DIVISION**

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

**AMERICAN CHAIN & CABLE COMPANY, Inc.**

BRIDGEPORT • CONNECTICUT

ARMY (E) NAVY

**ESSENTIAL PRODUCTS**...TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, MANLEY Auto Service Equipment, MARYLAND Bolts and Nuts, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Steel Castings, WRIGHT Hoists, Cranes . . . *In Business for Your Safety*

## ONE-MAN

# ROAD GANG

A GOOD example of how modern equipment helps contractors get their jobs done on schedule is this Le Tourneau Carryall and Caterpillar Tractor combination—a one-man operation.

On roads at home . . . on airfields at the front . . . wherever any type of contractors' equipment is used . . . one indispensable safeguard of dependable performance is effective lubrication . . . *Texaco!*

*Texaco Marfak,* for example, used in your tractors, shovels, bulldozers, trucks, etc., provides ideal film lubrication inside a bearing, yet maintains its original consistency at the outer edges . . . sealing itself in, sealing out sand, dirt, water. Its tough adhesive film cushions chassis parts against road shocks. Makes parts last longer.

For wheel bearings, use *Texaco Marfak Heavy Duty.* It stays in the bearings —off the brakes. Seasonal repacking is no longer required.

Texaco lubricants have proved so effective in service that they are definitely preferred in many fields.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States.

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FREE! 36-page booklet explains new low-cost protection against rust. Tells how to make equipment last years longer. Write for your copy.

TEXACO

# TEXACO MARFAK

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY